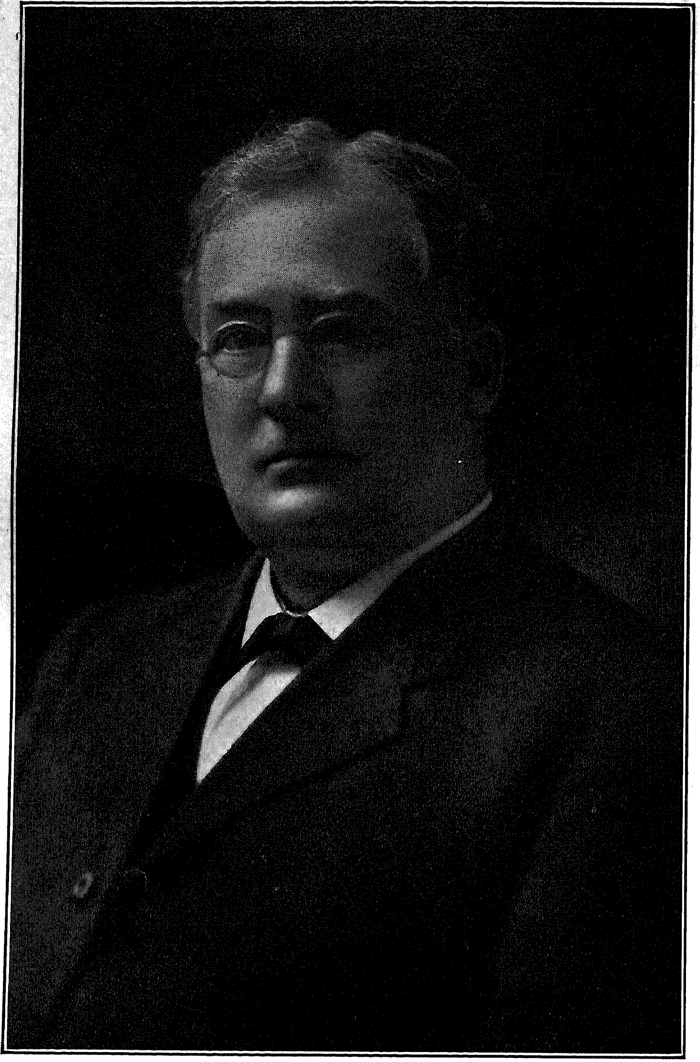

Daniel Augustus Tompkins

A BUILDER OF THE NEW SOUTH

BEING THE STORY OF THE LIFE WORK OF DANIEL AUGUSTUS TOMPKINS

BY

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TO THE YOUNG MEN
OF THE SOUTH
THIS STORY OF A LIFE
DEVOTED TO THE
UPBUILDING OF THEIR NATIVE LAND
AFTER ITS
OVERTHROW AND IMPOVERISHMENT
BY
CIVIL WAR AND RECONSTRUCTION
IS LOVINGLY DEDICATED
BY A LIFELONG TEACHER OF
SOUTHERN YOUTH

FOREWORD

THE rebuilding of the Southern States after the Civil War was an achievement of no less magnitude than the War itself. The overthrow of the South was accomplished in four years; its rebuilding was the work of half a century. Stripped of men and wealth, its industrial system shattered, its very civilization threatened with radical reconstruction, the South lay stricken and prostrate, while the victorious North was growing and waxing strong. A new generation was born and grown to middle age before the wealth of the South was equal to what it had been at the beginning of the Civil War.

But a new South was born at last, begotten of industrial forces. This achievement, which had been attempted in vain by educational and religious missionaries, by authors, editors, statesmen, and orators, was wrought at last by silent workers in field, forest, mill, and mine. They built a new South, not with sword and gun, nor with voice and pen, but with steam and electricity with skilled labor and machinery, with new roads and a new agriculture, with thrift and economy, with community spirit and coöperation, with democratic government and democratic ideals. Their achievement was characterized by largeness of vision, by mastery over men, and by capacity for work. Their toil and their endurance in peace were no less heroic than the courage and fortitude of Southern soldiers on fields of battle.

Among the foremost of these commonwealth builders was Daniel Augustus Tompkins, industrial worker, promoter, and missionary. He was fitted for the work by heredity and early environment, by character, talents and education. Born and brought up on a southern plantation, educated and trained in Northern technical schools, mills, and machine shops, inventive and receptive of new ideas, strong and energetic in body and mind, interested in everything pertaining to man, and full of zeal to help mankind by teaching men to help themselves, he was a rare combination of worker and philosopher, of student and teacher, of economist and philanthropist; a Southern Franklin, growing in poor soil and enriching the soil he grew in.

The story of his life is the story of the New South. It will be told in the following pages, as far as possible, by himself and in his own words.

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A BUILDER OF THE NEW SOUTH

A Builder of the New South

CHAPTER

EARLY LIFE

I WAS born,
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a child of the Old South.

The Southern plantation is described by Tompkins with unwearied and affectionate fidelity in various speeches and writings. He gives us a picture of its daily life—its work and pleasures, its useful lessons and fine training. It had laid the foundations of his great career.

“The plantation,” he wrote,“was a little world of itself. Some plantations comprised as high as ten to twenty thousand acres of land and one thousand slaves; but these were comparatively few. The entire investment in such a plantation would have been about one million dollars. On the other hand, there were a great many instances of small cotton planters owning ten or less slaves and three hundred or less acres of land. The capital in such cases would not exceed eight to ten thousand dollars. The great bulk of the Southern cotton crop was produced by planters who owned from fifty to one hundred and fifty slaves and two thousand to five thousand acres of land. It was this great class that made their plantation supplies on the plantation and made cotton growing a great institution."

Taking the average plantation of this type at 100 slaves and 3,000 acres of land, the equipment would be as follows: 25 plow hands, 25 miscellaneous hands, 50 women and children, non-producers, 25 mules, 4 horses for family and general use, 600 hogs, 25 head of cattle, 100 sheep, 10 goats, 15 dogs, chickens, guineas, peafowls, turkeys, geese, ducks, etc., blacksmith shop, wheelwright and other woodworking shops, 20 to 25 negro houses, gin house and screw, stables, barn, carriage houses and wagon sheds, and in many instances a grist and flour mill and a store.

Such an average plantation of 100 slaves and 3,000 acres of land, with its equipment, would be worth on an average about $100,000. It would produce about 100 bales of cotton besides all supplies. Such a plantation conducted with energy and good judgment would easily make $10,000 to $20,000 a year according to management and the price of cotton. Some planters were thrifty and economical and grew rich with great rapidity, while many employed overseers to look after their estates, and spent the incomes in travel or local extravagance.

The successful management of a large plantation required both energy and talent. The idea that the ante-bellum cotton planter was indolent, or an indifferent business man, or that he was always a spendthrift, is totally wrong. On the contrary he was, ever on the alert. He was judicial minded, energetic, usually well educated, always well trained in every operation connected with the production of standard crops. He succeeded by the same means that are necessary for success now, viz., by better education, better training, more energy and steadiness of purpose than the average of the people who do not succeed so well. The average well-regulated plantation was almost always in the immediate charge of the owner. If the owner was a professional man, lawyer, doctor, or preacher, there was generally an overseer. Many planters who were not professional men, also had overseers. These overseers had general charge of the labor. They blew a horn, or rang a bell, in the morning to call out the negroes to work, and otherwise looked after their labors in detail. It was the overseer who flogged the slaves when this was considered necessary. To aid the overseer or the planter in supervising and forwarding the work, negro foremen were selected, who led and directed their fellow slaves. At the noon-day rest and at the close of each day's work the foremen looked after the watering and feeding of animals and the care of tools and implements.

The planter usually rode over the plantation once a day, giving directions to the overseer, greeting and cheering the workers, inquiring after the absent, and in various ways manifesting his interest not only in the work but also in the workers and their families. The planter's son frequently accompanied him on these rounds; and in his father's absence the son would take his place. The young master was always an object of especial interest to the negroes. In a sense he was one of them. They had all 'helped raise him'; and the younger set had frolicked, sported, and escapaded with him. He was now grown beyond them, was in authority over them, but the same kindly sympathy remained. They now accepted the mastery of their former companion, or nursling, not merely from necessity but from affection, admiration, and respect for his superior intellectual and moral power. "The white boy or white girl of slave holding families," says "Cotton and Oil," "was to them something just a little more than ordinary humanity, and thus they could exercise an authority and an influence almost incomprehensible. These peculiar relations were not without influence on the white race. The control was not alone by force. The example of perfect conduct was important in two particulars. These were physical courage and the keeping of one's word. The negroes admired the man who was afraid of nothing and who never failed in his promises. Therefore the qualities of courage and truthfulness became highly developed; and to question either of these in any planter meant mortal combat or disgrace. Thus came the frequency of the duel in the South, though it never was so frequent as has been supposed."

Memories of sports and amusements on the plantation were with Tompkins a fountain of delight, bubbling over in his books and speeches. "The amusements on the plantation," he wrote in "Cotton and Cotton Oil," "were very numerous. In all of these the negroes took an interest, and in many participated. Fox hunting was very popular. Many planters kept fox hounds, some as many as twenty-five or thirty. It was not uncommon for ladies to ride after the hounds; and occasionally a privileged negro would be allowed to go. Almost every planter kept pointer or setter dogs, and hunted partridges. The planter's sons and negroes kept up usually a miscellanous collection of rabbit dogs, coon dogs, and 'possum dogs. Horse racing, chicken fighting, wrestling, and boxing were all popular and perfectly respectable. These sports were conducted with perfect decorum; and as a rule there was little or no betting. Betting was not unusual, however, and sometimes it would run high. House parties and picnics with dancing were frequent amongst the young white people, while barbecues, with political speaking or miscellaneous oratory, were indulged in by the older people. The negroes fiddled and danced much. The white boys and negroes hunted rabbits in daytime and coons and opossums at night. The life of the planter and his sons was hardy; and they loved hardy sports. These amusements, both indoors and outdoors, never interfered with the duties or domestic economies of the household or plantation."

"My brother was a great hunter," writes Hon. A. S. Tompkins, "rabbits in the daytime and opossums at night. He and the negro boys would often stay out till nearly day, with a few hounds on the place. He was fond of dogs and horses, a fine rider; was active and self-reliant from boyhood; was fond of bird hunting and a good shot on the wing when a boy. He was also a great swimmer. I remember his making a splendid bateau of wood and caulking it with cotton and tar; in this boat we would fish, often entirely nude. On one occasion our mother, going away from home on a visit, told us not to go in swimming during her absence more than once a day. He laughingly said to me, 'Let's stay in the creek all day,' which we did. We had much fun in this boat, and jumping off a spring board, diving often with a dozen black negro boy companions."

Day by day plantation life was developing for young Tompkins a sound mind in a sound body, a spirit of self-reliance, capacity for organization and leadership, knowledge of and sympathy with negro character, besides familiarity with agriculture and agricultural problems. His debt to the old plantation was acknowledged by Tompkins in books and speeches. "The Southern planter before the Civil War," said he, "trained his sons to the responsibilities of life better than is done now. In the old plantation situation wealth seems to have been no hindrance to the production of a whole man. The plantation rarely produced a snob or an incompetent. Perhaps the wholesome country air, proximity to the soil, and abundant exercise had their influence. There can be little doubt that these did have powerful influence. But the proximity to humanity and the development of friendly, even loving, sympathy for all kinds of humanity, and the practical apprenticeship in every kind of work done on the farm, did as much as the soil, climate, and exercise.

"The ante-bellum planter's son was not only in close personal association with the labor and the negroes on the place, but this relation with all about him was one of sound, practical human interest on both sides. By force of surrounding circumstances he was serving an apprenticeship for leadership. Whether required to work or not, no boy of sound mind and body could well grow up on a plantation without learning to plow, to ride a mule, to do all the operations of a plantation."

"My brother took an interest in the entire plantation," writes A. S. Tompkins, "and loved to do, as well as to see, every kind of work that was going on. He would often voluntarily plow all day, cut and shock oats and wheat, feed the cotton into the gin, or drive the mules around the big upright wheel under the gin."

The supervision of his father's plantation was often entrusted to young Tompkins, who quickly mastered the details of its work and management. But his chief delight was in the blacksmith shop and the shops for woodworking, where his constructive talent and his aptness with tools found opportunity for practical exercise. "In the carpenter shop my brother worked on everything from fixing an old gun or clock to making a complete wagon," says A. S. Tompkins. "He was fond of helping make the water wheels and trunks for our father's grist mill, a difficult task, and took great interest in the mill, working on the dam when needing repairs. I well remember when he took a notion to make a croquet set, balls, mallets, etc., and wore me out turning the old lathe for him. The balls were turned from walnut, and he made as good a set as you could buy.

"My brother made enough money, mainly by carpenter work at home before he went to college, to cover his college expenses. When a mere boy, not yet in his teens, he built a neat picket fence all around the yard at home. He was constantly busy helping to build and repair barns, negro cabins, and other farm houses. Immediately after the war, when times were hard, he was especially helpful to our father by building two bridges, which father got under contract from the County Commissioners of Edgefield County. I remember one of the bridges was across Rocky Creek near home. In fact, one end of the bridge landed on our plantation. My brother was only sixteen years old, but he went at that bridge with all the enthusiasm that Napoleon went at Lodi. He would wake up before day and lay restless waiting for day to break to go down to the creek and work on the bridge. He made a fine job of it; and the public said it was the best bridge ever put on that stream. All the logs and timbers for both bridges he got out with negro labor from the woods of father's plantation; and by superintending the work and planning the bridges himself, he made a profit of $2,000 on a $3,000 contract."

In the home also the lad was growing and developing under the guidance of a wise, capable, and rarely gifted mother. The women of the Old South have often been pictured as idle and self-indulgent, more energetic in the pursuit of pleasure than in the performance of domestic duties. Never was picture falser and more unreal. The typical Southern woman, the wife of the average planter, was a model of industry, efficiency, and unselfishness. Her domestic establishment was large, requiring for its management careful supervision with much physical labor. The household usually included, besides her husband, children, and domestic servants, a goodly number of visiting relatives, or other guests, with their retinue of children and servants. Passing strangers also were freely entertained, oftentimes with servants and horses.

Outside the family household also the planter's wife was burdened with responsibility for the health, conduct, and employment of all negroes who were not actively at work in the big fields. It was her daily task to inspect the negro cabins, to administer medicine, to give directions for work, health, and sanitation. When occasion required, as it frequently did, she performed the duties of midwife, nurse, physician, or spiritual comforter. Upon her the burdens of slavery pressed more heavily than upon her husband. Her life was largely spent in trying to remedy its wastefulness and inefficiency. Her finer nature shrank from its immoralities and cruelties.

To the negroes the planter's wife seemed scarcely less than an angel. Too often, alas! she was forced to become a protecting angel, standing between the overseer's lash and the cowering slave, between the weeping mother and the auction block. Her purity of life, sometimes in marked contrast to her husband's, her gentleness and firmness, her all-seeing eye and skilful hand, her tact, wisdom, and judgment, and especially her easy control over everybody, including even "old master," made her with the ignorant and emotional slaves an object not only of strong love, but of deep and superstitious reverence. Every negro on the plantation would have given his life in her protection. She was safe by night or by day in the remotest negro cabin, in the solitary woods, or alone and unattended on unfrequented roads. "The influence of the planter's family," wrote Tompkins in "Cotton and Cotton Oil," "was of greater importance than was ever appreciated in keeping the better natures of the negroes to the fore. A very generous and friendly kindness has an immense and far-reaching influence. During the Civil War the cotton plantations were practically in charge of the planters' wives, assisted by a few old and decrepit men and boys under sixteen years of age. It is the marvel of marvels that in this condition, lasting nearly four years, there was never an outbreak or a symptom of discontent among the slaves. The negro character itself, the very exact and practical knowledge by the planters' wives of the negro character and the past training of the negro, all contributed to this result. The extent of the trust that was placed in the negro's keeping and the perfection of its keeping on his part during the Civil War can never be fully realized or appreciated."

On some plantations, where the planter, being a lawyer or physician, was much absent from home because of professional duties, or was indifferent to all work and economies excepting the work of growing cotton in the big fields, the planter's wife, besides her domestic duties, had the care and supervision of the garden, the orchard, the dairy, the poultry yard, and even the piggery. The work also of the loom and spinning wheel, where such industries existed, came usually under her direction, as well as the cutting out and making of clothing for the large plantation population. It was an endless task, full of labor, perplexity, and nervous strain; but the planter's wife performed it, usually with cheerfulness, intelligence, and efficiency. Trained in such a school, many women developed ability and experience adequate to the management of the entire plantation. During the four years of civil war the women of the South, aided by half-grown sons, successfully managed the farms and plantations, supplying food and clothing not only for the entire civil population but also for the armies in the field. Such a woman of the finest type was Hannah Virginia Smyly, the mother of Daniel A. Tompkins.

"Our mother was of Scotch-Irish stock," writes A. S. Tompkins, "a cousin of John C. Calhoun, whom she much resembled in her pale, firm, clear-cut features. Her complexion was fair with light blue eyes and mild golden-hued hair, not red, but light brown bathed in sunshine. She was five feet six inches tall, rather slender in stature, weighing about one hundred and thirty pounds. Her health was usually good, although delicate, especially after living through the great strain of the Civil War. She was educated in the country schools and the village academy, and was graduated from the celebrated Moravian Academy at Salem, N. C., whose excellent training in handiwork and domestic science and arts, as well as in books and music, had attracted planters' daughters from all the Southern States. Our mother was a perfect complement to our father in person, character, and ability. He was large, stout, and ruddy, weighing over two hundred pounds, with coal-black eyes and hair, a brilliant man of great imagination, a ready and fluent speaker, fond of anecdotes and society, attractive and brilliant in conversation and social life, amiable and easy-going, more devoted to the practice of medicine and to scientific and philosophical study than to the details of plantation management. He owned a fine library, and was a diligent student of human history and human nature, delighting to search out the secret springs and motives of human conduct. Our mother was firm, with great decision of character, kind and sympathetic, full of religious faith which supported a strong sense of duty. She was an active member of the Baptist Church, and zealously instructed the negro children, as well as her own, in the Bible catechism, taking us all regularly to church and Sunday-school. Her words were few, clear-cut, and potent. The slaves loved, revered, and obeyed her. She was opposite to father in every way, matter of fact, industrious, and rigidly economical. She dominated him by superior will power and executive ability. During his absence in the army she was reputed to have made better crops and managed things better generally than he did when at home. Her talent for business, her energetic nature, and her strong sense of duty made her a perfect realization of the virtuous woman portrayed by King Lemuel, 'The prophecy that his mother taught him,' in Proverbs, Chapter 31, verses 10 to 31. She was just such a woman. I can see her now in my mind's eye as she sat by the fireside at night, during father's absence in the war, listening to the old overseer as he gave her the account of the day's work on the plantation. She knew every field, in what it was planted, its proper culture, and the quantity of daily work that should be performed. She kept track of all the cows and calves, of the sows and pigs, the flock of sheep, the mules and horses. Under her watchful eye the crops of corn, oats, wheat, and cotton were most carefully husbanded. She saw to the harvesting and grinding of the sugar cane and the boiling of the sorghum molasses, to the curing of the pork and bacon. Her vigilant eyes scrutinized the daily work and daily feeding of man and beast. Owing to non-intercourse with the North and blockade of our seaports all food and clothing had to be made on the plantation. We had a corn and flour mill run by water, a gin house with mule power, a molasses mill and boiler. My mother also fixed up a boiler to cook cottonseed and peas for cow feed. She raised plenty of chickens, turkeys, guineas, and ducks for the table, geese for feathers, and wool for clothes. The wool she packed and sent to Chatham Manufacturing Company at Elkins Valley, N. C., whence it came back in cloth for us and the slaves. She shipped hides to the tannery, and got in exchange shoes for the whole plantation. Toward the end of the war, when salt was very scarce, she dug up the salty earth in the smoke house, ran it through the hopper, and extracted the salt for table use.

"She was fond of bees and kept a lot of some twenty hives. It was amusing to see how my father, who was afraid of the bees, always got stung when he went about the hives; but she could walk up amongst the bees, who seemed to know her, and without alarm but with quiet ease could handle them with impunity. She always had plenty of honey. All the year round she kept up a most excellent vegetable garden, also a fine fruit orchard, especially apples and peaches, which she would dry for winter use. She was a good cook, too; and her negro cooks, although willing and capable, always did the kitchen work under my mother's personal direction.

"My mother wasted nothing, not even time; for she was always an early riser. Her capacity for details was truly wonderful. What with looking after the feeding and clothing of all these slaves and her own family, the farm work, the feeding of stock, chickens, etc., the care of the sick, the garden, the making of soap and candles, having the crops housed, grinding the grain, having the cotton picked, ginned, and packed, killing the hogs and trying out the lard, making sausage and liver puddings, etc., her dairy, her bees, smoking the meat, shearing the sheep, sending off the wool, seeing that we children went off to school well clad and with a bucket of bountiful dinner for the noon recess—I say, what with all these many duties filling each day, as the queen bee, on her well-equipped farm, it is amazing to me, when I think of it, how she ever did it.

"When the negroes were freed, she did not cower nor sit discouraged. Her fortitude rose nobly to the occasion, and she met it with undaunted courage and self-reliance. She was a daily inspiration to my brother. He would look up into her bright, clear eyes and catch the light of her conquered but undismayed spirit, and was ever ready to stand by her and help her amid adversity and sorrow. He loved his mother with wonderful devotion, because, I reckon, he was so much like her himself. They were both firm and self-reliant, strongly marked by decision of character. It was to her that he was indebted for those deep forces that beget genius."

At the close of the Civil War the South was bankrupt. Most of the planters were overwhelmed and ruined. The loss of slaves, the payment of old debts, the meeting of new obligations, the disorganization of labor, the general despondency and lack of enterprise were burdens under which even the strongest staggered and fell. Amid this general ruin a few survived by reason of exceptional wisdom, foresight, and thrift. Among these few was the family of Doctor Tompkins. "The fortunes of our family, at the end of the war," writes A. S. Tompkins, "were saved by my mother, my father, of course, coöperating whenever at home. Every year during the war my mother packed up, as a surplus, and stored away, about thirty-five bales of cotton. So, when the war ended, there was some hundred and thirty bales of cotton, which my father sold at over thirty cents a pound in gold, making about $20,000. I well remember seeing my parents together counting it. It was in shot bags, and as it lay in glittering piles on the bed it was a most fascinating sight. My mother had looked forward to this with that high degree of resourcefulness which characterized my brother. This money made my father comparatively easy, although he had to pay some rather heavy security debts."

At an early age the character of Tompkins, in its broad outlines, was clearly manifest. Those who attribute character chiefly to maternal influence will see his mother reproduced in the practical talents of her son: in love of work, executive ability, thrift, and economy, patience, persistence, and fortitude. His intellect was developing more slowly, but already was following the lines of paternal inheritance. "My father often urged me to keep a diary," he wrote in his memoirs. "I asked him what there was to fill up a diary in the life of a remote plantation worked by negroes, with no white person present excepting our family. He said in reply: 'You are living in the greatest era of the world's history. You have seen the emancipation of four million negro slaves and the preservation of the American Union. Our age is wonderful also for scientific discoveries and inventions. Some day you will be an actor in this age; and it behooves you to keep your eyes open, mind alert, vision clear, and spirit sympathetic to all the movements of humanity, whether they happen in your neighborhood, or far away in the distant parts of the earth.'"

Father and mother were happily blended in their oldest son. His intellect was his father's, his character was his mother's. His talents for leadership and mastery were early developed through the training of plantation life. With his father's imagination and mental grasp he was to conceive great enterprises; he was to execute them with his mother's patience, accuracy, and thoroughness.

CHAPTER II

EARLY EDUCATION IN SOUTH CAROLINA—SOUTHERN IDEALS—LATER EDUCATION IN RENSSELAER POLYTECHNIC INSTITUTE

AT THE age of sixteen young Tompkins was ready for the university. He had gone through the training of the old field schools and the Edgefield Academy, had received the usual instruction in Latin, Greek, English, and mathematics, had shown especial fondness for mathematics, indifference to the languages, and marked aversion to the weekly Friday afternoon exercises in declamation, debate, and oratory. These exercises were public, and were the most prominent and popular features of Southern schools. They were the nurseries of Southern oratory.

The popular fondness for oratory in the Old South amounted almost to a passion. Not only the hustings, but the bench, the bar, and the pulpit were arenas for the constant display of oratorical power. Every court week was a holiday, during which people flocked daily to the courthouse from the four quarters of the county, to hear the judge's charge and the lawyers' speeches. One day of each court week, even in years when there were no elections or political campaigns, was given over to political speaking. Regular political campaigns lasted five or six months, with daily combats of oratory between all the rival candidates. On Sundays the entire population, attracted by pulpit oratory, flocked to church. In rural churches service lasted all day, with two or more sermons each an hour long and delivered with vigor, zeal, and occasional eloquence. 'Forty-parson power' was no figure of speech in a Southern rural pulpit. The demand for orators in the Old South was unlimited, and the supply was equal to the demand. It was furnished by the educational system, which made the South a land of talkers, debaters, orators, and statesmen, of high and low degree.

The elementary schools had given Tompkins a surfeit of debate and oratory. His joy was the joy of work, his chief abhorrence was a war of words. And now in a select company of youth who sought higher education, not as preparation for life but as the equipment of a gentleman, he entered the University of South Carolina. He found a noble nursery of character and manhood, a perfect fruition of Southern ideals. There was an air of freedom about the university that nurtured men. Its presidents had all been marked by strong individuality and breadth of view. They represented the most divergent and extreme views of life: Jonathan Maxcy, Baptist preacher; Thomas Cooper, English radical and free thinker; Thornwell, rigid Calvinist; Barnwell, low church Episcopalian; Longstreet, Methodist preacher and author of "Georgia Scenes," and later James Woodrow, modern Calvinist and Darwinian. It may be doubted whether toleration of opinion in a state educational institution was ever carried further than in the University of South Carolina.

The students of the university were greatly influenced by this spirit of freedom, not toward belief or disbelief but toward manliness and independence of belief and of character. Professor Joseph Le Conte, whose experience as college professor in South Carolina and elsewhere extends through half a century, was filled with admiration for the South Carolina students. He writes of them as follows in his delightful autobiography: "I have said that the students of the South Carolina College were high-spirited though turbulent. I should add that I had never previously seen (nor have I since) so high a sense of honor among students in their relation to one another and to the faculty. No form of untruthfulness among themselves or toward the faculty (such, for example, as cheating at examinations) was for a moment tolerated. Any student suspected of such practices was cut by his fellow students and compelled to leave. When a student was brought up before the faculty for any offence, no other question was asked but, 'Did you have anything to do with this affair?' The answer was 'Yes' or 'No'; and he was condemned or acquitted on his own statement. Sometimes a student might, on some technical ground, refuse to answer, but no one ever lied."

The spirit of freedom and manliness thus highly developed in the University of South Carolina was characteristic of Southern life. It was the pride of the South and the admiration of her critics. One of the ablest of Northern statesmen, Hon. George Francis Hoar, an early abolitionist and a lifelong political foe of the South, bore generous testimony to the virtues begotten of this spirit: "Southern men were unsurpassed among the nations of the earth in courage, spirit, hospitality, and generosity to their equals. They were apt to command and apt to succeed. They were able politicians. With the love and habit of truth, which becomes brave men in all common concerns, they were subtle and skilful diplomatists when diplomacy was needed to accomplish any political end." Twenty-five years later, in his delightful autobiography, after longer and fuller experience, he repeats and strengthens this testimony:

"My long conflict with their leaders has impressed me with an ever-increasing admiration of the great and high qualities of our Southern people. Their love of home; their chivalrous respect for woman; their courage; their delicate sense of honor, their constancy, which can abide by an opinion, or a purpose, or an interest of their states, through adversity and through prosperity, through the years and through the generations, are things by which the people of the more mercurial North may take a lesson. And there is another thing—covetousness, corruption, the low temptation of money has not yet found any place in our Southern politics."

The leaders of the Old South were indeed men of courage and character. Many of them were nurtured in the University of South Carolina, for South Carolina was the heart of the South. Its strength and its weakness was individualism. Like ancient Attica, South Carolina cultivated and honored to the highest degree her favorite sons of genius, while neglecting the great mass of toiling humanity. The result was a constellation of stars that shone with rare brilliance in the political firmament and long guided the destinies of the South, but set finally in the dark and stormy sea of social and political revolution.

In the University of South Carolina Tompkins received excellent training from accomplished and gifted teachers. He was interested in several studies and proficient in all. He preserved for forty years among his private papers as valued treasures his lecture notes on geology under Joseph Le Conte, on natural philosophy under John Le Conte, on political economy and history under President Barnwell, on mathematics and engineering under General Alexander. He faithfully utilized all the opportunities of the university, not only in classrooms but in college life, taking an active part in social pleasures, athletic sports, college politics, and even in the much-abhorred literary society exercises.

But his heart was not in the work of the university. He longed for knowledge of life, for active participation in the stirring, striving life of the world around him. He saw his native State stricken and impoverished, its wealth destroyed, its industrial system disorganized, its future dark and uncertain. With fine penetration and rare vision he perceived that the need of his beloved South was not oratory and debate, but skilled labor and machinery, not political power, but the development of material resources. In these views and feelings he was cheered and encouraged by his professor of engineering and mathematics, General E. P. Alexander, a son of the Old South, a veteran of the Civil War, and a prophet of the New South.

"The first important influence in directing my life," he writes in his memoirs, "came from General E. P. Alexander, while I was a student in the South Carolina University. He was the professor in mathematics and engineering; and, while I was under his instruction, our personal relations became closer than that of professor and student, by a sort of gravity, as it were. I had a bent for industrial development, and he was the first person I had ever met who had any sympathy with my aspirations. I was very fond of construction; and he, as a graduate of West Point, had been an important constructing engineer before and during the war. In talking over with me my hopes and expectations, he advised me to seek a technical education as a civil engineer, and to learn a trade also while studying to be an engineer. He recommended to me the Rensselaer Polytechnic Institute, at Troy, New York."

General Alexander was a man of marked ability and versatility. His colleague, Joseph Le Conte, says of him in his charming autobiography: "Professor Alexander, who had been Chief Engineer in Lee's Army, was a hearty, whole-souled, enthusiastic friend and companion and a kind of genius in mathematics and especially in engineering." He was not only a mathematician and engineer but also an English scholar and versatile writer. Above all, he was a capable man of affairs with fine executive talents. He was soon called from the university into the active life of the business world. General Alexander found a congenial spirit in Daniel A. Tompkins, and loved him as a brother. "If you get down as far South as this," he wrote Tompkins from Alabama in 1878, "be sure and stop and see me—for you are one of the scholars I was proud of, and I always remember you with very great pleasure." Their friendship was kept up by correspondence until Alexander's death.

Following the advice of General Alexander, Tompkins was enrolled in the summer of 1869 as a student in the Rensselaer Polytechnic Institute at Troy, New York. It was a long step from a Southern literary college to a Northern school of technology, from a South Carolina cotton plantation to a New York manufacturing city. But the spirit of the institute and the spirit of the city was also the spirit of Tompkins. He rejoiced to find halls for drafting and designing instead of literary societies for debate and oratory; to see displayed on the college walls not portraits of politicians but sketches of bridges, engines, and buildings; to hear discussions about power and machinery instead of debates on secession and state's rights. Not a student in the institute was expecting to be an orator or a statesman. Nobody was there from fashion nor for gentility. Everyone had come for work. The Lares and Penates of the institute were not Calhoun, Hayne, and McDuffie, but Newton, Watt, Stevenson, Franklin, and Roebling.

From the very start Tompkins took rank among the best students. He not only did the work but enjoyed it; and by his character, conduct, and superior work made impressions upon his college mates which remained fresh and strong for half a century.

"As I recall the long-ago days at Troy," writes one of his classmates, "I see Tompkins as a bright and clean fellow, for whom we had always high respect. He was among the best scholars in the class, his percentage ranking among the highest. As a draftsman he excelled all his classmates. Although quiet and reserved in his manners, he displayed a strong character, having his likes and dislikes, but was always gentlemanly and courteous. Being older than I, he advised and assisted me in my studies, for which I have never forgotten him."

"I was Tompkins' roommate a couple of years at Troy," writes another. "While cordial and considerate, he was generally quite reserved. His self-reliance was unusual for his age. He was absolutely honest in his conversation, without fear of any kind, and very independent, so far as the usual student customs and traditions were concerned. He belonged to no secret society, but was elected Grand Marshal in his junior year, an honor always before carried off by secret society men. His means were apparently limited, but he always kept up his end whenever he joined in any student frolics. I do not remember his using tobacco, and he was very sparing of intoxicants, a little beer being his limit. He showed strong, determined, honest character, a little high strung and sensitive. He was generally fair in his judgments, but with little patience for what we now call dudes, and none for mollycoddles. He was a clean, high-toned fellow, of strong, manly character. I recall his punching a masher who tried to flirt with a lady friend, who resented the liberty and told Tommy of it."

"We lived in the same boarding house and on the same floor," writes H. B. Binsse. "I saw him nearly every day for three years. We became fast friends, as I was greatly drawn by his manly, dignified, upright character. His character was unusually attractive. He was straightforward and frank, but never offered opinions which he knew would be disagreeable. His conversation was always delightful, for he was full of original points of view. He was a born leader. He had perfect self-confidence with a clear, well-poised mind, very keen perception of character, and great breadth of view. When he was graduated, he was regarded as the most promising man in his class."

The instruction in the Rensselaer Polytechnic Institute did not at that time include practical work in mechanical and electrical engineering. These departments were not equipped with shops or laboratories. The instruction was not satisfactory to Tompkins, who thought that a complete education should combine practice and theory. On his father's plantation he had learned the value of practical work in the blacksmith and carpenter shops, in the gin and compress houses, as well as in the planting and harvesting of the cotton crop. He had always been a practical worker; and now, as a student of the institute, he was not content with theoretical knowledge of mechanical engineering. With fine resolution and wisdom he obtained for himself in the city the practical instruction which he could not get in the college. During his entire college course of four years he was at work every Saturday and all the vacations in the mills and machine shops of Troy. "During the long summer vacation of 1870," writes his college mate, N. B. Kellogg, "Tompkins and I were the only students of the institute who remained in Troy for the summer, except resident pupils. He secured employment in the Bessemer Iron Works, while I was assistant to one of the professors in his city work. Tompkins did this work, not for the purpose of getting money, but more for practical experience. He went in as a working hand to become familiar with the operating of the Bessemer plants. I remember hearing that he then developed the plates for a 'converter' for the first time, they having been cut by trying and fitting until then, especially the curve of intersection of cylinder and oblique cone at the top. This was no great engineering achievement, of course; but no one had thought of doing it before, and no one thought of doing anything else afterward."

Although busy with books and work, Tompkins found time for enjoying the usual pleasures of college life. He was one of the editors of the *Tripod* and member of the boat club. His personality was quiet but attractive, and secured for him the highest honor within the gift of his fellow students, election as Grand Marshal of the college. "I have a special reason to remember Tompkins," writes his classmate, Charles Campbell, "for he defeated me for Grand Marshal, an office in which he represented the whole student body, the highest office within their gift. He represented them in all conferences with the President or Faculty, or with the Mayor of the City, in organizing and leading processions and festivities on public occasions, and by presiding at all meetings of the entire student body. He deserves great credit for the honor. I coveted the office with a youthful ambition from the day of my registration. Tompkins was a calm and judicial-minded man, an unpretentious and hardworking student, plain in dress and address, not taking a prominent part in athletics. His recreations were of the best and simplest nature. He was there for business and not for pleasure."

There is something picturesque, almost pathetic, in this incident of a Northern student body selecting for their leader the son of a Confederate soldier and slaveholder. The students gave it especial emphasis by presenting Tompkins with a gold-headed cane, inscribed, "R. P. I.—To D. Augustus Tompkins, from the Students—Grand Marshal—May 30, 1873." He preserved the cane, and bequeathed it as an heirloom to his brother.

While engaged in vacation work Tompkins made the acquaintance of Augustus L. Holley, an engineer of rare talents and character. For the second time in his career he was brought into close contact with a large-minded friend, capable of recognizing talent and generous in inspiring youthful ambition. "Before my course was finished in the institute," he says in his memoirs, "I fell in with Mr. A. L. Holley. He was a young engineer who was introducing the Bessemer process into this country. Youthful as I was, I recognized in him a man of ability. I did considerable work for him tracing drawings during my vacations. He also gave me work to do in my room while I was attending the institute. Through his influence, too, I secured work during my spare time at 'Poly' in the John A. Griswold & Company's Steel Works of Troy, where I took a course of apprentice and machine shop." Mr. Holley was at this time and until his death a trustee of the institute. In 1875 he became president of the American Institute of Mining Engineers and member of the Government Board for testing structural material.

Upon graduation from the institute Tompkins was invited by Holley to become draftsman and private secretary in his office in Brooklyn, New York. The invitation was accepted, and the friendly relationship formed during college days was continued a year longer, with satisfaction to Holley and inspiration for Tompkins. "My service under Holley has always been of immense value to me," says Tompkins in his memoirs. "He was a man of remarkable ability and extraordinary amiability." The following testimonial, written at this time by Holley, was carefully preserved by Tompkins among the treasures of his early life: "Mr. D. A. Tompkins, a graduate of the Rensselaer Institute, has been employed by me as draftsman, and in working up machinery designs, for more than a year; and I part with his services now only on account of my proposed absence from the country. I take pleasure in stating that Mr. Tompkins has proved himself to be an accurate and a remarkably rapid draftsman; and that his industry and fidelity, as well as his technical knowledge, fit him to be a valuable assistant in any engineering work."

Before leaving America Mr. Holley interested himself to secure for Tompkins employment in the Bethlehem Iron Works under John Fritz. It was time for a change. Although pleasantly situated, Tompkins was getting restless under the monotony of the drawing room, was eager for active work, was anxious to be making, producing, creating something real and tangible. In a letter to his friend and classmate, Walbridge, written near the end of his year in Brooklyn, he says: "My work here is pleasant, but not in the right direction. I am fixed in my determination to work out a career in iron; and I shall do this, even if I have to renounce all claims upon the men who have already succeeded, and work my own way up from a one-horse blacksmith shop." With this purpose he was glad to leave Brooklyn and to be enrolled as a workman under John Fritz with the Bethlehem Iron Company.

But this year in Brooklyn was not given entirely to work. Social life attracted him very strongly. Invitations were frequent, to and from college mates and other friends, for dinner, theatres, excursions, and other pleasures. His social instincts were strong and well developed. The hospitality of his father's home had always been large and generous. It had become a part of his nature. "Come over to-morrow about five o'clock. We will see Mr. Holley, dine at my house, and go to theatre," he writes Binsse. "I would be glad to have you come over some evening, and go to the theatre with me, and spend the night, if possible. I think I might be able to make it a pleasant evening for you; and it certainly would be a great pleasure for me to have you"—to another classmate. He takes Christmas dinner with Frith, spends Sunday with Binsse at Long Branch, goes to churches, theatres, museums, art exhibits, and libraries, as well as shops, mills, and factories. Everywhere he is observant and thoughtful. His faculties are alert; his mind open and receptive. His letters to home folks are readable and suggestive, clear-cut and natural in style, as well as instructive and entertaining. The following illustrates his mental habits: "New York is all ablaze with Christmas presents and preparations for the usual festivities on New Year's. Everybody gives and everybody expects to receive presents; and there is a sort of general rejoicing and calculating whether the sum total of presents received is greater than that of presents given. I am, of course, a silent and watchful observer, expecting neither to give nor to receive. I have lately been to an artists' reception. Before telling about it, I will tell what an artists' reception is. There is an association of the artists in Brooklyn, and amongst the number are many who make good pictures. Once a year they collect together all their pictures and have an exhibition and reception, allowing in the meantime enough rich people, who are not artists to join and pay the expenses. They have the Academy of Music floored above the chairs and richly carpeted, in order to make a nice promenade. A door has been cut between the Academy and the art room, which is the next building to the Academy, so that it is all made into one grand suite of rooms. The art rooms are lined with pictures, the Academy richly ornamented with flowers, and everybody who can possibly get a ticket, goes. The tickets are given away only by the artists. I was given two by an artist who was pleased with having heard that I had spoken very highly of some of his pictures in New York. I am much delighted that I went. I looked at the pictures and saw the promenaders from the gallery of the theatre. I never saw such magnificently dressed women, fine music, and beautiful flowers and pictures in my life. It was a sort of realization of an artist's dream of life. But the greatest of all the New York wonders is Henry Ward Beecher. The originality of his sermons is something I have been more surprised at than anything I have heard since I came here."

While employed by Holley and residing in Brooklyn Tompkins formed the acquaintance and friendship of a refined, cultured, and once wealthy family, whom he delighted to visit. His amusing tales of boarding-house discomforts, his manifest love of home life, his strong character and marked personality induced them to accept him as a member of their household. Here began a friendship of two congenial souls, ripening into the deepest love, whose fruition was prevented by the early invalidism and untimely death of his beloved. For ten years he poured out his soul to her in letters that mirrored his daily life and thoughts. After her death these letters were returned to him; and after his death they were found among his private papers, folded and sealed with hers, witnesses of hopes and longings that were never realized. Extracts from those letters are given in the following pages, revealing in distant glimpses the warm and tender heart of a man apparently cold and reserved, unlocking the inner doors of a life through which, thereafter, few if any ever entered.

CHAPTER III

APPRENTICESHIP IN THE BETHLEHEM IRON WORKS—JOHN FRITZ—CHARACTER DEVELOPMENT

HIS life with the Bethlehem Iron Works is mirrored by Tompkins in letters to his beloved, which present not only a record of his work but an interesting picture of character development.

The Bethlehem Iron Works was at this time the chief steelmaking plant in America. It was under the management of John Fritz, America's foremost iron master, a sturdy, rugged, inventive, self-made German. As a young apprentice Tompkins came to Fritz almost with reverence, presently he inspected him and examined him with cool and critical independence, finally he estimated and valued him with just judgment and grateful appreciation. His apprenticeship in the mills was spent during a long period of commercial and financial depression throughout the business world, a period wherein many businesses perished and few expanded.

"I arrived in Bethlehem yesterday and saw Mr Fritz. He has given me employment at $75.00 a month."

. . . .

"I am very fairly started at my work, which so far has pleased me very much. Mr. Fritz has me working on a design for some new engines."

. . . .

"I have a feeling that I ought to persist in being absolutely punctual at my work, until I shall have something to identify me with the work. For instance, since I have been here I have been working a good deal on the design of some new engines which Mr. Fritz speaks of building; and, if he should conclude to build them, having had most to do with the design, I would naturally be depended upon to keep everything straight; and that dependence would make for me a sort of tie. I want to have it so that when I am away they will miss me; and it seems to me the best way to get a start in that direction is by punctuality and a willingness always to accept responsibilities."

. . . .

"I have been reading the last two nights a book that has afforded me the sort of satisfaction that religious persons receive from the Bible. The book is by Philip Gilbert Hamerton, and is called 'The Intellectual Life.' He calls disinterestedness the highest quality of a fine character."

. . . .

"Last night I went to see Davenport in "Othello" at Allentown. I walked back after the play, having Frith with me for company. It is six miles."

. . . .

"Acting upon your suggestion to discard my old clothes altogether and buy some that are plain and neat for the works, I have purchased the cloth for a pair of pants, the sum total of cost will not exceed $3.50; and they are better than you would infer from the price. The necessity of economy will not allow me to get an outfit at once. The most I can do is to look the best I can afford.

"Upon examination of my feelings in the matter of dress in social life I am come to the conclusion that my contentment with being ill dressed is not so much indifference, after all. The being without a competency for reasonably good living I have frequently lamented, not with thinking of the pleasures money would afford but of the embarrassments and privations it would free me from. Of course to be able to buy a book I want and to be able to visit and entertain my friends would be after all pleasures by money; but the pleasure I should have would be from the company of the friends, and not the ability to entertain them. But the being poorly dressed has rarely, under any circumstance, been a source of any embarrassment to me; but, on the contrary, has at times been a source of great satisfaction.

"The satisfaction has come from my having in the first place very little money to spend for clothes. I knew it was either be content with bad ones, or be very much cramped—sometimes not even having this last alternative. Secondly, my bad clothes have been for me a thermometer, as it were, by which I have been able to arrive at a more just estimate of the characters of various persons I have met. I desire the opinion that is held of me to be on account of the permanent part of myself and not on account of temporary qualities, such as (the good one) of being well dressed. That is to say, I want to form friends upon whose permanence I could rely under any circumstance; and therefore I feel that I must gain them by such qualities as circumstances cannot affect. Such a quality is self-respect, such an one is disinterestedness, such is fidelity to friends—and all that compose the virtues of a noble and honorable man."

. . . .

"I told you that Mr. Fritz had me working on a design for some new engines. It is now determined to build them, and yesterday the work was fairly begun. The first thing to be done is to have wooden 'patterns' made of all the parts that are to be made of cast iron. These wooden patterns are used to make the molds in sand in which molten cast iron is poured to make the castings.

"If you are at all interested in such things, I will explain something of the different sorts of work necessary to construct a machine. Most machines are composed principally of cast iron and wrought iron. Your stove is cast iron. The shovel and tongs are probably wrought iron. The first is made by being molten and poured in a mold formed in the sand. The second is made by a blacksmith. The first is called a 'casting', and the shop and appurtenances where it is made is a 'foundry'. The second is a 'forging' and is made in the 'blacksmith shop.'

"The 'molder' (a man who works in the foundry) must have a model or 'pattern' of what he intends to mold in order to make the impression in the sand. This 'pattern' is made of wood and frequently requires great skill. The pattern for a very ornamental stove would require to be made by a very skilled workman. Therefore, to be able to make a machine, a 'pattern maker' is necessary and a shop for him to work in.

"Neither the blacksmith nor molder can make their work look polished and smooth, the one using only a hammer and anvil, and the other making his mold in such material as sand. Neither can they be very accurate. To make all the pieces accurate and well fitting, they are given into still another shop—the 'machine shop,' where the machinist with lathes and planers and drill presses and slotters planes this and that side smooth—turns this piece perfectly round, drills a hole at this place and that, and files and chips and whits away until all the pieces are exactly what is wanted, and then the machine is put together.

"Thus, the castings commence with the pattern maker—then go to the molder and then to the machinist. The forgings come from the blacksmith shop and go to the machinist, also. With the machinist, they are all finished and put together.

. . . .

"The parts of the engine I have designed are now in the hands of the pattern makers and blacksmiths. It is gratifying, because it is the first work of very considerable importance I have been given to do. They are what are called compound engines and have not been much built, so it is a sort of new thing. I will not bore you with a scientific explanation of the engine unless you show sufficient interest. Some of the patterns for the engine are nearly done and to-morrow will be carried to the foundry, where the molds for the castings are made."

. . . .

"My room affords me more and more pleasure with each day. You can't magine what an improvement it is over the ordinary house to have a nice room with one's own things in it, and it really makes quite a homelike sort of place for me. I haven't that feeling of living nowhere; and it is particularly desirable now; for I was forever spoiled in Brooklyn about living in boarding houses. Before I came with you, I knew nothing better, I was hardened to it. And it is wonderful what pleasure I have from the auxiliary nice things sent with the furniture."

. . . .

"I have invited Walbridge to visit me, and I have heard that he intends to accept the invitation very soon. Should he do so, the visit will be a great pleasure to me; and my nice double bed will make me able to keep him in my room instead of having to send him to the hotel. And to be able to entertain him myself will be very nice. I felt mortified when Binsse came to see me that I couldn't entertain him entirely myself."

. . . .

"Walbridge is here visiting me, and I am much pleased. Yesterday (Sunday) morning I took him to the works, stopping on the way at a little flower garden, the owner of which I have made an acquaintance with."

. . . .

"To-day nearly all the officers wanted to go to the State and County Fairs holding respectively at Easton and Allentown. On such occasions my adherence to work is always more pleasure to me than a country fair could possibly be."

. . . . .

"You mustn't imagine I am working and overtaxing myself. This voluntary work I have been doing, for example, is the working out theoretically what was intended to be done practically; and it is therefore of no special use, except that it is pleasant to be able to answer questions about the result. It pleases Mr. Fritz to see that I am taking an interest in this work, and it is easy to keep up an interest in my work when I keep it up at the same time as a study."

. . . .

"I am reading George Eliot's 'Silas Marner'."

. . . .

"I spent the evening doing some work for Mr. Holley. He had written me to send him a drawing of a small piece of machinery; and I made the drawing in the evenings. Extra work I want to do—like reading this or that book, getting a drawing of this or that to keep for reference—usually fills up my evenings. The time seems fairly to fly by."

. . . .

"So despicably poor is the iron trade come that these works are speaking of making another reduction of ten per cent. upon all wages and salaries. This is exceedingly disheartening, but to think of giving up would be the worst possible thing now. But I have foregone all immediate prospects so long that it seems sort of hard fortune to have the prospects decline in my own path, just as I was beginning to reach a fair starting point."

. . . .

"Because I tell you so much I want to be economical, do not believe that I love the money or in any way love to keep it. I don't expect to become independent by saving money out of my present pay, but I must learn the habit of economy now. Moreover, I do not desire to have money for the purpose of keeping it, but for the purpose of using it for comfort's sake."

. . . .

"You are to my better self an invaluable mine from which jewel after jewel is added to my refinement and my feeling and my mode of thought, to make them delightful to myself and pleasant to all who know me. You are to me what the sun is to a flower, that lights it up and makes it beautiful and fragrant. My life until I knew you was but as the seedling of a flower that could become nothing beautiful so long as it remains away from the nourishing light. You have already nourished this life and given it sufficient strength to weather quite a stormy night, but it needs your goodly rays on the morrow to regain new strength and keep it well, alive, and prosperous. And to continue our metaphor still further, as the shades and tints of a flower can never be seen by any light so well as by that which makes it, so the refinement you have lent me could never be appreciated so well as when I am under your immediate influence."

. . . .

"I will go into the drawing office to-morrow. I objected to it, but did it principally for appearances, since I had as leave stay there three months as not. But I did not want them to think I liked it, so they would not wonder, when I insist upon having other duties after the cold weather is over. Mr. Fritz said he wanted me to go and get the plans ready for the work for next spring and summer, while it was cold and the men cannot work out of doors. That seemed to hold out the idea I should have something to do with the work when it was commenced outside. It is two new furnaces he is building."

. . . .

"The coal miners are on a strike and half our works are stopped on account of having no coal. Very many workmen in this region have no work, and many of them go about like vagrants. There is a vacant room at the works here, under some furnaces (which make it warm), and in this there are tenanted about fifty that have collected from the country around. They live there and buy what they eat. One would imagine them to be a very forlorn and and disconsolate looking set, but on the contrary there is no crowd more jovial. They make speeches, have dances, play cards for imaginary wages, and drink imaginary whiskey from imaginary glasses with such toasts as, 'Here's to the rich man that won't give us work—may he get sick on Monday—get worse on Tuesday—die on Wednesday—be buried on Thursday—go to h—— on Friday—and burn on Saturday.' They are very much the same sort of people as the beggars in a city, low, shiftless, vulgar, and brutal, who ask for alms with a mean scowl on the face. Of course, it is the worst type of workman without work."

. . . .

"I think if we could get coal, things would really begin to brighten up. The coal trouble is attributed by some to the operators and by some to the miners; but in my mind it is principally due to the fact that many of the rich and controlling men at present are not fit to control."

. . . .

"I don't like the drawing room (where I am now at work). I shall ask Mr. Fritz to change me to some sort of other work in the spring, about the first of April, and will not stay where I am, even if he makes serious objections. I had rather be idle. Not because I mind work, but because I don't like sedentary and confining occupation. I hoped when I first came here he would take some interest in me and advance me when he could and advise me what I should do to qualify myself for advancement; but I learn he has always been close with everyone and will yield nothing except what is positively demanded. I am not very sorry for this, because after all I had rather feel responsible to make an effort myself for what I want, than to have to wait for the action of Mr. Fritz. If he had taken a positive interest in me and shown it, I should not have felt responsible and would have left a good deal to him I had really rather have in my own hands. Don't understand that he don't allow me a fair chance. He gives me every advantage, but leaves me entirely to decide my own course of overcoming difficulties."

. . . .

"The knowledge of a good reward at a certain time is one of the greatest stimulants to human energy and contentment. For instance, I am willing to soil my hands and do a great deal of unpleasant work and do it contentedly, too; but my contentment comes from the prospect that I shall some day be fixed so that the work I do is not only pleasant but fascinating and useful."

. . . .

"I have been troubled in my dealings with Mr. Fritz. I was worried with the way he put me off, and when he refused to give me an audience at all, it made me exceedingly indignant, but I said nothing, of course. Next morning when I arrived at the works I found him standing on the office steps and when I passed up he said to me, he had not meant to give me a short answer the evening before, but that his manner was the result of his having been much worried during the afternoon. In my own mind, the truth of the matter is, he wants to make a draftsman of me. If 'tis true, he never undertook a more impossible task in his life. I don't know yet how I shall go to him again. I could let Mr. Holley see him, as he offered to do; but I think Fritz would imagine I was afraid of him, and therefore Holley shan't do it."

. . . .

"I have been trying of late to get together a sort of record of my work that I may keep for reference. Most of to-day (Sunday) has been employed with this work."

. . . .

"Most of my work is in connection with the new blast furnaces we are putting up. A blast furnace is simply a large furnace in which coal, iron ore, and limestone are put and kept ignited. The coal is put in, to make heat and to melt the iron ore and limestone. The limestone does for the pure iron contained in the ore what soap and water does for the hands; that is, takes up and removes all impurities, then the iron, being heaviest, sinks to the bottom of the furnace, and the molten limestone, containing the impurities, floats on top. Then, by operating a hole, in or near the bottom of the furnace, the iron runs out. Of course you will understand this to be not anything of a scientific explanation, but only just something to give you an idea of what a blast furnace is. Such a general explanation makes it a very simple thing, and in reality there is nothing complex about it; but there are a great multiplicity of details that bring into requisition a very great number of mechanical devices and principles.

"There must be a blowing engine, to blow air into the furnace to make it burn, and pumps, to furnish water to keep the parts near the intense heat cool—there must be a large stove or oven, through which the air must pass to make it hot, so it won't cool the material outside—and boilers to generate steam for the pumps and engines. All these things are first put down on paper, and arranged and re-arranged until it is thought to be in the best shape. Then wherever any strain or force will come, it is necessary to calculate what size to make the part to bear the strain. The latter things are the ones I am principally engaged in doing. Mr. Fritz tells me he wants a certain thing for a certain purpose. Then I go to work, and get up an engine on paper, and let him look at it."

. . . .

"Were you so bored with the engineering letter that you dread another? Then you need only write me not to write about machinery and grease."

. . . .

"During the week I have been remarkably social, having made two calls upon young ladies. The visits were not made with much expectation of enjoying myself, but I thought I needed to rouse myself from the monotony of working all day and reading all evening."

. . . .

"I am reading at odd times two books: one is Paley's 'Evidences of Christianity' and the other, Plutarch's 'Lives.' I haven't much interest in the characters from a historical point of view, but Plutarch enters very much into the motives that impelled men to action and also in the discipline to which many men subjected themselves to accomplish any purpose; and from his accounts in this way I can draw many morals and good maxims to govern me. Of the biographies as history I don't expect to remember much, and don't know what use I would have for it if I did."

. . . .

"I have been out of doors all day hammering and pulling and measuring about some machinery that is being put in place. If I could just get enough to do outside to occupy me about three fourths of the time, so that I would have only a quarter to spend at drawing, it would be delightful. And by degrees I hope to get it just as I want it."

. . . .

"I had resolved upon trying to get Mr. Fritz to increase my pay; and to-day a notice was put upon the front of the office saying another reduction of from 5 to 20 per cent. would be made in all wages and salaries the first of Sept. With this excuse to put me off I am sure it would be utterly useless to go, and would only weaken any future effort. While I feel fretful and despondent, I am not despondent in thinking of my work. Sadness or disappointment does not unman me, as I have seen it do in some instances. My resolution to push firmly forward, to help myself and help others where I can, is always firm. Perhaps I may lose some interest for a few days, but it comes back, and being of this temperament is a great help to going through any disappointment."

. . . .

"I have been reading for some time a history of the French Revolution, in which I have been much interested. When it is finished, I will take up Buckle, a liking for whom I already have from the accounts I have heard."

. . . .

"Almost all my time is spent at the works; and if I had an unrestrained license to do anything I pleased, 'twould be really fascinating. Every now and then I find myself forgetful of ambition and success and suchlike possessions in my interest in some work I sometimes find myself engaged in. For instance, the furnace, when it was being finished, when the gas was being prepared, the dampers put in, the valves adjusted, etc., etc., to get everything in readiness to make a certain principle operate,—makes the principle, itself, fill my mind—and the watchfulness to know whether all the conditions are fulfilled to make it succeed becomes altogether a sort of game or play that holds a man in excitement until the time is reached when it is shown whether it will or will not work. This furnace was very like the old furnaces, so that, if anything had been omitted to make it work, there were men about who could have explained the difficulty. But it went, with very little trouble, and is now working all the time."

. . . .

"Last Sunday I went to Phila. to see the Centennial buildings, not from curiosity or fashion, but to see the manner in which the work on the buildings was put together. I could not have seen it after the painting and frescoing, etc., etc., were finished."

. . . .

"What a long journey life must be for people who spend most of it in idleness. I come to this conclusion because of the quickness with which time passes when one is engaged. There is always so much that I want to do for myself, and I must do it in the evenings; and unless I determine beforehand what shall be done and in what order—otherwise rule out all matters of inclination—I find the time passes and nothing is done. I commenced with this thought, because it is the one that is in my mind and was recommended by the difficulty I have in finding time to read the Life of Theo. Parker."

. . . .

"The Society of Engineers in New York have an exhibit of working drawings of machinery in the west gallery of the Exhibition, main building.

Amongst them is a set of drawings of the machinery here in the Bessemer Mill that I made while I was with Mr. Holley. I made all that are there from these works."

. . . .

"Iron works must run all the time when they run at all; and for a man to be of much available use it is necessary to be absent as little as possible, and particularly for any one desiring to grow more useful. Therefore, because I need the advantages that continuous presence here will help me to, and because I don't feel the need of a rest, I wouldn't feel that I was doing right to take a holiday to-day. (July 4)."

. . . .

"The works here jog along about the same. There is now one species of comfort, and it is that iron and steel are lower in price than they have ever been before, and they can't possibly get much lower, so the only change must be for the better."

. . . . . .

"I have been for more than ten days strongly urging upon Mr. Fritz my desire for other work than that of drawing. It has proved so far useless; and hearing a few days since of a man in Phila., who intended to build a new machine shop, I went to that city for the purpose of undertaking to get the position of running it. I found, however, it was a mistake, and that instead of starting a shop, he intended to shut up and stop his foundry.

"While, however, these things are lamentable, they do not worry me, for I feel quite sure that the very thing that acts as a sort of prejudice in my case is in itself a source of strength, and will increase, until it brings the matter right some day. There is naturally a prejudice on the part of practical men to have educated men advanced; and since the practical men have everything in their hands, the effect of this advantage must be felt by the pioneer of education, in which position I am unfortunate enough to be placed, if it is a misfortune; and since R's failure I have all the taunts to carry.

"Mr. Fritz is away now and has been for a week; and in such times there is always more or less annoyance, because he leaves no one definitely in charge and all of about ten subordinates vie with each other in carrying the air of most authority."

. . . .

"I have been very busy in the drawing room all day, and feel the need of some exercise. The sedentary character of my work I very much abhor; and Mr. Fritz seems as stubborn as a mule in resisting any change in it. Not even with an offer to work for less will he give me any satisfaction, but avoids a decision with a sort of temporary excuse."

. . . .

"I have been for a long time wanting to get out of the drawing room. Mr. Fritz has always found an excuse to keep me from making any change. He started last week to Europe. I told him I would not stay in the drawing room while he was gone. He objected and offered many excuses, etc. He knew of nothing he could put me at. I offered to work as machinist at machinist's wage. To have refused my offer at reduced pay would have been too evident perversity; and so he was cornered with my being determined to use a desperate remedy and bear the consequences.

I have been now in the shop about ten days, and though of course I don't enjoy having less pay, I do feel a great satisfaction to have had the strength of will to succeed in what I wanted to do, even at a sacrifice. I don't know yet what my pay will be, but no matter what it will be, I am gaining an experience I have felt the need of, and have the pleasure of feeling that nobody helped me to what I am getting, but I had to get it myself and at a sacrifice. After dreading to do it, I am surprised to find how much pleasure I take in it after it is done. I believe, however, that those other people lead the most tranquil lives. There is no use in philosophizing, however."

. . . .

"I am now fairly at work in the machine shop and like it very much—

1. Because, although it is harder work in one sense of the word, yet it is more in the way of advancement than the drawing room is. I never liked the drawing room. To be in the drawing room (without practical experience) is very like being surgeon in the army. An energetic private has a better chance of continuous advancement.

2. The work only seems harder, and is really not half so hard. It is more healthy, physically and mentally.

3. Because it gives me a foothold where I wanted it. They don't tell me what they will do about my pay; but that is of the least consequence, since when I acquire the practice I am working for I will be much better qualified for the place Mr.

Holley offered me at Troy, which I could get at any time.

"Mr. Holley and Mr. Fritz are both in Europe."

. . . .

"I am working in the machine shop on a roll lathe—turning the rolls through which the hot iron passes in the mills, to make it in the shape of rails. I like the work, and do not find it arduous or particularly tiresome. My pay is put at $2 per day, quite as much as I expected. I am more than satisfied that it is a good thing for me to do, and that I shall be well repaid in the end. The pay is quite sufficient for me to live on.

"I have just learned that it was a matter of a hair's weight one way or the other with the higher officers of the Company whether I should go to Europe with Mr. Fritz or not. I am told he was anxious to have me go with him as private secretary. I am not sorry for having missed it; for in doing so I am now laying in a store of experience I always felt would be necessary before I could fairly enter the path I desired to beat; and it has always been an annoying thing to feel that the sacrifice, as it were, was yet before me."

. . . .

"I feel more and more satisfied with myself for having made the change of my work into the shop. Mr. Fritz is back again; but I have no idea what his state of mind is in regard to the matter, since he does not now even deign to speak to me. This neither disconcerts nor discourages me, however; for when I took the step in opposition to his advice and wishes I knew he would not heed any of those scruples of conscience which might influence other men. But he had, on the other hand, done nothing positive in showing his displeasure, and is therefore open to adopt any course or opinion of me that my work may justify."

. . . .

"I am convinced more every day of the wisdom of my going into the shop. This place is considered a good one to come from; but I am afraid it is not a very good one to stay at, provided advancement is the desire of a young man. Therefore, I am sure I have done right in giving my time to those pursuits that will give me strength and invest me with the capability to justify at another place what would be expected of a Bethlehem man."

CHAPTER IV

LAYING FOUNDATIONS—AT WORK IN GERMANY—GERMAN CHARACTERISTICS—THE BROKEN BOLT

DURING the years of his apprenticeship at Bethlehem, Tompkins was laying foundations for larger things, saving money, making investments, projecting enterprises, measuring his employers, looking beyond the mill. The second year of his apprenticeship he formed a partnership with a young merchant in Edgefield, S.C., for the sale of cotton ties, and invented a buckle to improve the tie. The ties and buckles were made by Tompkins in Bethlehem and shipped to his partner for sale in South Carolina. His surplus wages from the iron mill were invested regularly in building and loan stock. He soon became a director in the Building and Loan Association; and, finding that it was badly managed, he threw it into bankruptcy, bought up the stock, and organized a new association, of which he was secretary and general manager. With fellow workmen he organized a coöperative company for buying land and building houses. This enterprise, however, was not perfected nor well developed before he left Bethlehem. He made investments in railway stock. He built a residence on one of his lots in Bethlehem; and retained ownership of it until his death.

In the midst of these varied activities he kept up his work in the mill, and nourished a lively ambition for promotion. He longed to be an iron master like John Fritz—to build in the South a Bethlehem Iron Works. His non-promotion in the mills was a keen disappointment, which he bore with a brave spirit of patience and a clear consciousness of merit. He wrote to John Fritz the following letter, a model of dignified, manly, and modest appeal and remonstrance:

"In behalf of a matter which seems to be of great concern to me, I wish to call your attention concisely to the following facts: My earnest desire, whilst I have been here, has been to get into practical work. Whenever I have spoken of this matter, the tendency of your replies has seemed to have been that you would keep the matter in your mind, etc. I am impatient now of nothing else than that after four years (within six weeks) I am as much in the dark as to the possibility of such a change as I desire as at the beginning of that time. To continue in the same way, with no further knowledge of your disposition in the matter, might lead me to the end of four more years with the same result.

"If it is impossible to gain confidence in my ability to conduct practical work by other means than beginning anew, it is essential to me that I should know it; for to wait much longer will put me beyond that period of life at which that can be done without great sacrifice. In the time that I have been here, I have done more practical work than is often found to be done by men in the same position, yet, withal, my present position has a constant tendency to constrain me from the way of it, and in itself gives no advancement, my pay having been $2.00 per day when I took it, and being now $2.87. With the large increase in machinery to be taken care of and the attention this will require of someone, it seems to me now that it would be easily practicable for you so to arrange the distribution of the work as to give me the opportunity to enter into that system of habits I desire to improve, even if I continue to do the drawing at the same time, which I am perfectly willing to do.

"I have heard you speak of having requested and been granted changes of work in your early life upon the same ground as that upon which I now place my request. A matter which I mention only to ask you to remember how important they were to you at that time, and that this request of mine has the same importance to me now, and is specially important as being a part of a definite plan of life I have laid out to follow.

"I have omitted any reference to the changes that have taken place, nor have I made any comparisons of the merit or pay, nor referred in any way to the large bit of minor matters to which I might call your attention to my advantage, and have refrained from putting anything forward before you, except that the time is come beyond which such a change as I desire to make becomes more and more difficult to me, and cannot but fail to be of that advantage to me as if made whilst I am yet young enough to take a hand in all those duties of machine construction and repair so essentially necessary to make me useful to myself and a creditable pupil of yours.

"I have made my desire, as expressed above, as simple as possible; and I ask as a favor a plain answer as to its accomplishment, assuring you that I am (for my own good) as anxious to advance your interest as mine."

This letter caused no breach between them, for they were genuine friends at heart. In dispositio and character they much resembled each other Clashes between them, though hard and obstinate never struck fire. Their correspondence in afte life continued through all the years, and was marke not only by mutual admiration and esteem but b deep affection. Fritz was constantly asking Tompkins' advice about the education of his nephew and Tompkins was always sending Fritz affectionat greetings and tokens. When Fritz's eightieth birthday was celebrated, twenty years later, at the Waldorf-Astoria in New York City by the four grea American Societies of Engineers, Tompkins was selected among all the men whom Fritz had trained t make response at the banquet to the toast, "Joh Fritz's Old Boys."

Tompkins was tied to the Bethlehem Mills fo several years by an overmastering ambition to fi himself thoroughly for the career of an iron maste as well as by a pleasant consciousness of being almos indispensable to John Fritz. There was no plac in the mills, as then organized, for the full exercis of his talents; and mill expansion at that time wa prevented by financial and industrial depression.

Opportunity came for engineering work and experience elsewhere. Newly invented machinery fo rolling hoops was to be installed in the Schwerte Iro Works in Westphalia, Germany. The America manufacturers, B. Lauth & Son of Philadelphia applied to Fritz for his most efficient, reliable, and intelligent machinist to go to Germany, set up th machinery, and train the German workmen to ru it. The commission was offered to Tompkins an accepted. Without knowledge of the German language or acquaintance with the German people h did the work successfully amid great trials and perplexing difficulties.

A few extracts from letters to his beloved will make a picture of his life during this trip abroad.

. . . . . .

"I have spent a week in Philadelphia seeing the hoop mill packed to be sent to Germany."

. . . .

"With a very few exceptions the passengers on this ship are German, or at least German-speaking people, and although they all speak English, yet German like, they stick almost entirely to German in conversation. It is called by those who have crossed more than once an unsociable gathering of passengers. Still, it is marvelous how well we come to know one another's habits even though the knowledge of names is not so common. Sunday after leaving New York I was a little sick—just annoyingly sick. I would feel comfortable enough on deck, or even in my stateroom, but at the table would soon begin to get uneasy about the stomach, and to perspire about the forehead, and have to leave. It was while I waited for the steward to fetch what I ordered that I would get sick. Finally, I ordered a good meal put at my plate, and stayed on deck till it was done. Then I went down and fairly crammed myself full, and hurrying back on deck found the sailors hoisting a sail, and I took hold with them and tugged away with the best; and that was practically the last of my sickness. A N. Y. swell tried the same remedy, but with less success, in as much as he skinned his hands on the rope and was sicker than before. The way wine is drunk is a marvel to a temperate American. The most inoffensive and harmless-looking men will drink a full bottle of claret at every meal. My vis-à-vis at table declares himself satisfied with one glass of sherry, one of port, and two bottles of claret. He is a braggart, however, I think. It seemed very queer to see German ladies, sick and trying to eat at table, turn pale with sickness trying to eat a little, then turn and drink off a glass of beer to keep the stomach settled."

. . . .

"I am now in Schwerte, having been here probably six hours. It is Sunday. Mr. Krieger, the superintendent of the works, took me this p. m. to drive. We went to several towns adjacent. To-morrow I go to the works.

"I reached Bremen yesterday morning at 10:30, spending the day and night there. During the day I strolled about and looked at the town, which is very attractive. In the evening I went to hear some music, Bilse Orchestra. I learned afterward that I had heard the orchestra of a man who excels Th. Thomas—in fact, the best orchestra in the world. Even to me, who understand little of music, it seemed superior, and that before I knew the man's reputation.

"This morning I spent in Cologne enjoying the Cathedral, the grand sight of the city. Six hundred years it has been building, and will be finished next year. As Bilse is superior to Thomas, so that cathedral service was far superior to anything I have ever heard in America. Innumerable men loaf about the front and want to show strangers the church for anything that will be given.

"Schwerte is a small town and the hotel I am at is not good, but is the best in the place. But mean little hotel as it is, the clerk wears a dress suit."

. . . .

"I am now keeping the hours of German workmen. The machine is in running order and for the last ten days I have been with one set of the men who will run it. Next week I must take the other set and instruct them, and then in the succeeding week we will run the machine night and day with the two sets of men. I get up at 5½ A. M. and get back home at 7½ P. M. The first few days I had to do everything myself. As a rule, Germans are hard workers and willing workers, but not particularly bright about comprehending a new idea. Of course, in this chaotic state of beginning I cannot say how long I must be here."

. . . .

"These people wish to use the machinery I brought over for a great variety of work; and to adapt it to this purpose has required of me a great deal of work. And because I do not understand the language, I must do a great deal that the workmen ought to do.

"The town is a dull little place, and now that all the novelty of the place is past it is rather a bore.

"The German working hours annoy me much. The people are like the Germans in America. They are never done working and never get anything done—they spend thirteen hours at the works and do less than an American in three hours.

"But I shall soon be done now and will see you again. The Lauths say they will build one of these machines to make band iron in Alabama and have promised to give me charge of it. If all goes well, then we will be at last all right, little girl."

. . . .

"In Germany and in Schwerte I have seen many things that pleased me, but taken all in all I shall not be sorry to turn my footsteps homeward. I shall, however, always look forward to another trip to this country when I can have time enough and leisure enough to learn to speak the language.

"I now go to the works at 6 A. M. and come home at 7 P. M. As the men become used to my machine these hours will become less."

. . . .

"During the week just past I have been very busy finishing a vast number of small details necessary to try the mill, I have made one experimental trial and it went well. I am now still further completing the details, which will require ten days or so. But next week the iron works will not run on account of wanting to make general repairs, and in that interim I will make a little trip on the Rhine."

. . . .

"I have just returned from up the Rhine, making the trip with Thurston and his wife who were passing this way. I have taken advantage of every opportunity to see the towns around here and think I shall not have a desire to travel much when I leave. My present idea is to see Paris and London a day or two each, and perhaps one or two little excursions in France and England.

"My trip to Germany pleases me very much and I believe will have been just such a one as I could most have desired. I have lived here, and it now has to me the same familiar air that Troy and Bethlehem will always hereafter have to me. I was glad to meet the Thurstons, and spent a very pleasant day with them in Cologne and another on the Rhine."

. . . .

"I have had much to do here, and some of my work has been hard and tiresome. But I have learned much also, and have had the opportunity to pick up much valuable information.

"I am a very poor student in the matter of German and cannot yet speak it at all."

. . . .

"They have a man here who is always with me and he now has a very good idea of the machine. But he is, as is the rule of Germans, sometimes stubborn and sometimes stupidly stubborn, as only Germans can be.

. . . .

"Mr. Lauth had represented to these people that the machine (which is a new invention) was able to do much more than has been heretofore possible. I have had to make many experiments and improve it in many respects to make it fulfill their requirements.

"The director of the company, a Mr. Dickerhoff, has been extremely kind and liberal in his bearing toward me, but some of the subordinate officers have annoyed me very much with telling lies. I have not deigned to take the least notice of them, but will review these things when I make my final report.

Mr. Dickerhoff's uniform civility and patience makes me admire him very much."

. . . .

"Here it is October, and I never dreamed of being here later than September 1st. The work has been done exceedingly slow. Work here is always done with a good deal of fuss, while very little is done. In fact, the main object in life with these people is comfort and uniform comfort. They eat and drink from morning till night. They have more working hours, but lose so much time during work eating and drinking, that I am sure they do not half the work that an American would do in shorter hours. I thought this wasting of time was only amongst the workmen; but a few days since I had some drawing to do, and fixed up a board in a vacant room near by, and I was surprised to find that each clerk had a bottle of beer stuck in some hole in the room; and would slip in once or twice during the morning and drink a glass of beer and eat sandwiches. The head clerk himself was one of the crowd. Funny to see the bold face some of them would put on and the celerity with which they would slip the bottle in its hole when they heard footsteps. But while these things seem small, there are probably other ways in which the workmen are better than ours. The general manager is an excellent man."

. . . .

"I have been making a little trip through some of the important German cities, leaving the machine in the hands of the workmen. Although I have seen much that is interesting on this trip it has been a sort of bore. I am coming more and more to find no interest even in the most interesting things, unless I can have some company that would be interested with me. Leipzig, where I now am, is a great university town, as you probably know already, and is the publishing place for Germany and in fact, largely for Europe. The Tauchnitz edition of books is published here."

. . . .

"I am disappointed in Paris. All its finery and gorgeousness etc., etc., with a few exceptions, are of the ballet type. 'Tis unquestionably the city of vice, but vice without the coarseness it has in other cities. Of course I am often cheated, in consequence of not being able to speak French."

. . . .

"Since my arrival in London I have done nothing but order some clothes. My passage across the Channel made me very sick and I have slept nearly all day. I go to-morrow to Manchester to see machinery, etc., and hope to sail the next day. In my anxiety to get off home I am almost constrained to leave undone things for which I know I should be afterward sorry."

. . . .

His trip was now ended. The work he had undertaken was very difficult, but he went at it bravely and put it through. He had learned much of life, had seen the Old World, and was glad to be back in America.

An incident of his work in Germany was described by Tompkins twenty-five years later. It illustrates his resourcefulness and skill as a workman at that early period and his tenacious memory in later years of events long past. The incident had not impressed him at the time as worth relating.

THE BROKEN BOLT

"Sometimes an incident which seems insignificant has a touch of something which particularly appeals to humanity, while again some of our best efforts seem to fall flat in the presence of humanity.

"While I was in Germany setting up machinery for the Bethlehem Iron Company, or in which the Bethlehem Iron Company had patent interest, a little incident occurred upon which I laid no stress whatever and which in reality was a very small matter, and yet the story of it seems to have travelled the world over. As all stories do when they travel, this one has been magnified, but the sentimental feature has always remained in it.

"There was a big engine in the rolling mill in which I was working which operated considerable of the machinery in the mill. It was probably an engine of 1,000 or 2,000 H. P., possibly more. It was set up on a cut stone foundation. The foundation was about 10 feet deep, and there was a surrounding wall built to make a space down to the bottom of the foundation. The foundation bolts went through lugs on the two plates, then down through a hole which was about 4 inches round drilled into the stone. At the bottom there was a pocket through which the nut, or key, at the bottom of the bolt could be put in place. These foundation bolts were 8 or 10 feet long and 2¼ or 3 inches in diameter. One day one of them broke about the middle. The engine was a heavy one, and they were afraid to run it without this bolt. The top end, of course, was easily pulled out. The construction of the foundation with the pocket at the bottom had been made in a way to get the nut out easily, but when it came to lifting the 4 or 5 feet of $2\frac{1}{2}$ inch metal out of the hole, everybody was balked. Attempts were made to shove it up from below by putting short pieces of metal under it one after another, but they never could get it up more than one or two pieces of the metal high. They fished for it from above with nooses made of wire, they tried to make long-handled tongs to reach it from the top, but they could not make these hold. The management was getting impatient and intolerant. The general manager rarely came into the mill, but he finally came to take a look at a trouble which had already kept the mill standing a day, causing a large number of men to be thrown out of employment. Coming by my mill, which was running, the manager chatted pleasantly, telling me about the difficulty they were having with the big engine. He started over toward it, but turned and came back to where I was working, and asked me to give my tongs to the helper and come and see if I could not suggest some way to get the bolt out of the hole. I told him he had good men there already, but he insisted, and I went over. When I got there, a happy idea came quickly to my mind. I asked if they had the top end of the bolt which they had already pulled out; they answered 'Yes,' and I told them then to get a piece of $2\frac{1}{2}$ inch pipe and bring the top piece of the bolt and the pipe to the blacksmith shop. I heated the pipe, belled out the end of it a little, swaged it a little to make it a little too small to go on the bolt. Then everybody saw what was going to be done. I took the pipe into the mill, stuck the end of it in a heating furnace, called for a bucket of water, let the pipe down through the hole, and drove it hard over the end of the bolt, then I poured the bucket of water on it. The shrinkage clamped the pipe so tightly on to the bolt that after the two had been pulled up together they could not be separated except by splitting the pipe. The thing that seemed to me at that time of more consequence than the operation was the prompt assumption of the credit of the whole thing by the general manager. He did not undertake to take any credit away from me, but he said and repeated and re-repeated that everybody was most stupid not to have gone for the American immediately; that he really believed, if he had not come out and thought of the American himself, that none of them ever would have thought about him. He said that everybody knew an American could do anything, and thought it was a strange thing that they wasted so much time, when an American was so available.

"The story got into the papers in a maudlin sort of way, and it seemed to make a catchy story. It came to this country, and was circulated in the Northern States, where manufacturing at that time was mostly done. One paper had it that it had become necessary to get one of the anchorage bolts of the Brooklyn Bridge out of the foundation, and that I had done it, and got $10,000 for it, although it was only a few minutes' work. Of course this was a version made by the writer, to make the story more interesting and to make it locally applicable.

"On a recent trip to New York a gentleman in the

Waldorf-Astoria Hotel remarked that he had just heard a story about me, and related the story based upon the above incident. Thus after so many years the story seems to circulate, because people seem to like something about it which I don't see."

CHAPTER V

STUDYING INDUSTRIAL CONDITIONS—THE OLD INDUSTRIAL SOUTH—D. A. TOMPKINS, ENGINEER, CHARLOTTE, N. C.

ON HIS return from Germany Tompkins was strongly tempted to remain in Bethlehem. Absence had intensified his popularity and magnified his usefulness. His return was a signal for universal manifestations of regard. The City Council chose him as a Burgess to fill a vacancy, the Democratic Club elected him President, Fritz urged him to accept his old position in the mills. To others his prospects seemed bright and full of promise, but not to him; for he felt within himself longings that could not be satisfied and powers that could not be developed in Bethlehem. His heart was in the South. Memories of early life, family love, devotion to the land of his birth, had been strengthened and intensified by absence and by work in new industries. His feelings were not displayed in public but were known to his intimate friends. "He was with all his heart devoted to the South," writes H. B. Binsse, a collegemate and fellow worker, "and from the first wished to work and live there. While at Bethlehem he determined to devote his life to development of the South, and he consistently aimed in that direction. He was offered to my knowledge an excellent position in Chicago, which he refused for this reason."

As soon as it was known that Tompkins would leave Bethlehem, offers of employment came to him from all quarters, from Holley and the Lauths, from former collegemates at the institute, from manufacturing establishments in Philadelphia and Chicago, from engineering enterprises in Tennessee, Alabama, Kansas, and Missouri. Everybody that knew him was desiring his services or recommending him to others. It is significant of his deep though silent emotional nature that he carefully filed and preserved until his death all the correspondence of this period, precious testimony to the high esteem which had been earned by his life and work in Troy and Bethlehem.

Resisting all temptations to live and work in the North, Tompkins now devoted himself for a year to the study of Southern industrial history and the inspection of Southern industrial conditions. He visited all the centres of new industrial activities in the South and carefully studied local conditions. Fifteen years before he had gone North to college with despondent feelings about the future of the South. He shared the prevailing belief that Southern industrial inferiority was the natural result of climate, a belief which was not likely to be changed by residence in the North and work in Northern mills and shops and factories. Among thousands of Southern youths who after the Civil War sought education or employment or professional careers in Northern States, few returned to their native land. They saw everywhere in the North increasing wealth and power, while the stricken and impoverished South offered a vision of perpetual poverty.

But the clearer insight of Tompkins looked through this dismal prospect, and discovered in the earlier history of the South an industrial development which gave hope not only of future revival but possibly of greater expansion. His study of Southern industrial conditions filled him with enthusiasm.

"When I left South Carolina to go North," said he, "I thought I was leaving a country which had never had any important manufactures. Later, when I was in the middle of industrial life in the North, I conceived the idea of writing an industrial history of the United States. To my amazement I found that the agricultural South, from which I had come in a spirit of industrial despair, was the cradle of manufactures in the United States.

"The industrial development of the South was as much advanced a hundred years ago as that of any other part of the Union. The census of 1810 shows that the manufactured products of Virginia, the Carolinas, and Georgia exceeded in variety and value those of all the New England States taken together. There were more homespun cotton manufactures in Virginia, South Carolina, and Georgia than in the thirteen other states and territories; more flax in Virginia than in any other state. Prior to 1812 Southern manufactures were in the line of household arts. These manufactures were generalized and dispersed, not localized and integrated; the aggregate was considerable.

"In the Piedmont region of the Carolinas many charcoal blast furnaces were in operation a century ago. Cotton mills now operated by water power are on sites which were formerly occupied by Catlin forges, rolling mills, cotton factories, and other manufacturing plants. At these forges and rolling mills were made bars, nails, plowshares, and other products. One product was a special metal for rifle barrels.

There were notable gunmakers in the Piedmont region in the time of these forges and rolling mills; and they required an extra good quality of metal for their rifles. These gun-makers supplied to the home people and to the frontiersmen of Tennessee and Kentucky most of the rifles which played such a part in frontier life, and were such a factor in the early development of American civilization. I have seen a copy of a contract in accordance with which the entire machinery equipment for a cotton mill was constructed in a machine shop at Lincolnton, N. C., in 1813.

"When the Union was formed and a nation was organized, the order of the states in population and wealth was, Virginia first, Pennsylvania second, North Carolina third. In enterprise and development the South surpassed all other parts of the Union. The institution of slavery changed the relative position of North and South, the institution of slavery—not the negro—but the institution. The negro has never been in the way of industrial progress as much as the Indian was originally. But the institution of slavery had a tremendous adverse influence; and this would have been the same if the slaves had been white instead of colored.

"The Southern States prospered before slavery became the dominant influence. The prosperity before that time was a prosperity of manufactures, commerce, and agriculture. As slavery grew in importance and influence, manufactures and commerce declined. The invention of the cotton gin emphasized the importance and profit of cotton culture with slave labor. The South became a country exclusively devoted to the production of staple crops: tobacco, rice, cotton, and sugar—all with slave labor. The free white mechanics were driven to the Northwest. My own grandfather owned and operated a carriage factory, which, for lack of white mechanics, he finally abandoned in favor of cotton production with negro slave labor.

"Those who advocated slavery were interested in the extension of the system to the Southwest. The system founded upon agriculture with slave labor alone necessarily fell. From the time that slavery became the dominant influence the South made very little progress. From 1830 to 1860 South Carolina and North Carolina practically stood still; then wealth fell into the hands of fewer people, general development ceased, resources were neglected, migration was large and constant both to the central Northwest by white laborers and to the Southwest by slave owners with their slaves. As far as the character of the people and the resources of the country were concerned, the industrial progress of the Piedmont Carolinas should have been parallel with that of Pennsylvania."

That the South was capable of industrial development was shown by its industrial activity during the Civil War. Cut off from the outside world and stirred by the stimulus of a great war it exhibited mechanical skill and inventions of a high order, great in number, variety, ingenuity, and utility. Every plantation, every farm, almost every cabin became a mill, a factory, or a little workshop. By the close of the war the South was producing not only its food supplies, clothing, house furnishings, farming tools, and machinery but also its military and naval weapons and equipment. The rebel ram was the forerunner of the modern battle ship. The submarine was a rebel invention.

But at the end of the war the high price of cotton and the ease of cotton culture again diverted the energies of the South from manufactures, and concentrated them almost with magical quickness upon the sole business of cotton growing. Homespun industries, recently nourished by the necessities of war, now decayed like mushrooms. Forges, carpenter shops, tanneries, and the like small industries formerly existing on large plantations, were now in ruins, abandoned for cotton fields. Looms and spindles, recently humming in every cabin, were now idle rubbish, except in the cabins of poor whites where they lingered obstinately for another generation. Even long-established agricultural industries fell into neglect and contempt. Horses and cattle, hogs and sheep, hay and oats, cornmeal and flour were no longer regarded as necessary products of the plantation. Nothing was grown on the plantation that could be purchased elsewhere. A big crop of cotton would buy whatever was needed. If the sale of the crop at the end of the year failed to pay the store accounts, it would at least start a new credit for the new year. Cotton was king—white cotton, shining in the big white fields.

The passion for raising cotton became almost a craze. Its victims were not only the big planters but small farmers, poor white tenants, and ragged negro hirelings. Everything else was imported from the North: food, clothing, tools, machinery, horses, hay, oats, pork, beef, flour, meal, cheese, butter, condensed milk, even fried potatoes, in boxes and barrels, cooked and ready for the table. Commission merchants in the cities and retail merchants in the towns held in mortgage practically the entire South. Interest, compounded and recompounded, rolled up an ever-increasing aggregrate of debt. Everybody was staggering under the load; and everybody kept on raising cotton—enormous crops of cotton, increasing in size but not in value. Prices were falling below the cost of production.

Amid the general feeling of despair and the imminence of bankruptcy there was a saving sense of humor. People smiled at their own follies and misfortunes. Popular orators and writers burlesqued the prevailing industrial madness; and with fine humor sought to laugh the South into industrial sanity. The eloquent Grady pictured this folly in his description of a Georgia funeral. The description was so pleasing to Tompkins that it became a part of his mental furniture, and he never failed to quote it when occasion permitted. Said Grady:

"I attended a funeral once in Pickens County, Georgia. It was a poor 'one gallus' fellow. They buried him in the midst of a marble quarry; they cut through solid marble to make his grave; and yet a little tombstone they put above him was from Vermont. They buried him in the heart of a pine forest, and the pine coffin was imported from Cincinnati. They buried him within touch of an iron mine, and yet the nails in his coffin and the iron in the shovel that dug his grave were imported from Pittsburgh. They buried him by the side of the best sheep-grazing country on the earth, and yet the wool in the coffin bands and the coffin bands themselves were imported from the North. The South didn't furnish a thing on earth for that funeral but the corpse and the hole in the ground. There they put him away, and the clods rattled down on his coffin, and they buried him in a New York coat and a Boston pair of shoes and a pair of breeches from Chicago and a shirt from

Cincinnati, leaving him nothing to carry into the next world with him, to remind him of the country in which he lived and for which he fought four years, but the chill of blood in his veins and the marrow in his bones."

Southern literature of the period just before and just after the Civil War abounds in similar pictures and similar appeals to Southern interest and Southern pride. Henry A. Wise of Virginia, Cassius M. Clay of Kentucky, Hinton R. Helper of North Carolina were zealous and unceasing in efforts to stem the torrent of cotton madness. One of the wisest, thriftiest, and most prudent planters of North Carolina, the Hon. Paul C. Cameron, of Orange County, made an earnest appeal to his fellow farmers for reform in industrial aims and methods: "I know not when I have been more humiliated, as a North Carolina farmer, than when a few weeks ago at a railroad depot, at the very doors of our state capitol, I saw wagons drawn by Kentucky mules laden with Northern hay, for the supply not only of the town, but to be taken to the country. Such a sight at the capitol of a state whose population is almost exclusively devoted to agriculture is a most humiliating exhibition. Let us cease to use everything, so far as practicable, that is not the product of our own soil and workshops—not an axe, nor a broom, nor bucket from Connecticut. By every consideration of self-preservation we are called to make better efforts to expel the Northern grocer from the state with his butter, and the Ohio and Kentucky horse, mule, and hog drover—from our county at least."

In the midst of this industrial depression, when cotton culture seemed likely to ruin the South, Tompkins decided, after a careful survey of the

Southern industrial field, to devote his life to the promotion of cotton manufacturing industries and the diversification of Southern agriculture. On March 31, 1882, he located in Charlotte, North Carolina, the centre of the Carolina Piedmont region, and hung out his sign:

D. A. TOMPKINS, ENGINEER, MACHINIST, AND CONTRACTOR

CHAPTER VI

THE CAROLINA PIEDMONT—THE BEGINNINGS OF THE NEW SOUTH

THE selection of Charlotte as his home and the base of his industrial operations was eminently wise and fortunate. There is no region in the Southern States better adapted to manufacturing industries than the Carolina Piedmont. Its water power is large and constant. The annual rainfall is more than sixty inches. "No other area on this continent," says Professor Shaler, "contains as numerous streams of constant flow." The elevation ranges from 500 to 1,000 feet, moderating the heat of summer, while the latitude produces mild and equable winters. Its varied scenery presents to the eye one of the fairest sights in America.

The population of the Carolina Piedmont is mainly of English, German, and Scotch-Irish stock, a hardy, self-reliant, and liberty-loving folk. While very conservative and slow to change, clinging tenaciously to ideals and institutions inherited from their ancestors, they are not dull nor indifferent to the logic of events, but observant, intelligent, and quick-witted. This population is less affected by immigration than any other of similar size in the United States. It is almost entirely native, less than one per cent. being foreign born.

The soil and climate of the Piedmont district are well-adapted to small grains, fruits, clover, grasses, cattle, and poultry. At this period, however, the chief industry was the culture of cotton and tobacco. Adjacent to the Piedmont district on the east is the Atlantic Coastal Plain, devoted at that time exclusively to cotton culture. On the west is the vast Appalachian mountain region, peopled by the same sturdy stock, as yet scarcely connected with the outside world, and by long isolation from it kept in a backward state of primitive and antiquated agriculture. This mountain population supplied an overflowing reservoir of strong and sturdy humanity, ready for migration and employment elsewhere.

To the centre of this great Piedmont region and into the midst of its strong, sturdy, and as yet unprogressive population came D. A. Tompkins, industrial missionary and apostle of the New South. He entered upon his work with a kit of tools, a brave and honest heart, a firm faith in himself and in the future of the South.

"When I went to Charlotte," he wrote in his memoirs, "I asked nobody any favors. I was a machinist. I looked out for my own work, did each job that came my way the best I could, and this was generally better than my customer or employer expected—kept at work, and kept cheerful.

"Whenever opportunity presented, I endeavored to point out the future possibilities of Charlotte and the South generally. All I ever said about those possibilities has come true and been exceeded.

"In 1882 I advocated building a cottonseed oil mill. In 1884 I advocated building cotton mills. My 'optimistic talk' met with little or no favor. Meanwhile, I always kept at work."

While slight attention was paid to Tompkins' optimistic talk, there were many who observed his work. His reputation for skill, honesty, and efficiency grew rapidly, extending beyond the limits of the city and county. His circle of friends and patrons was steadily enlarging. His friends in the North were watching his career. They believed that a new force was entering the industrial life of the South. The Westinghouse Company of Pittsburgh offered him the agency for the sale of the Westinghouse engine. Their offer was accepted, for it fitted in with his purpose to engage in the sale of power-producing and power-economizing machinery: engines, boilers, gins, compresses, saw-mills, and the like. The agency gave promise of growth, but success was not easy; for prejudice, ignorance, and stubborn conservatism stood always in his path. He entered at once upon extensive correspondence, seeking customers throughout the Carolinas and adjacent states. He advertised freely by circulars and newspapers, and travelled extensively. Extracts from his diary and from letters to relatives show that he was not idle nor despondent nor asleep to opportunities, but always full of hopeful philosophy, observing character and studying industrial conditions.

"I am just back from a trip trying to make contract to put in a 40 H. P. engine for some parties up the country. After the most earnest effort I did not get the contract; and it seems really hard. I offered to put in the whole thing much cheaper than any one else, and yet lost the contract. I don't think this signifies any serious lack of confidence in me or in my machine, but is only the difficulty of a new man and a new house and a new engine."

. . . .

"To-morrow I will go to Shelby, 50 miles west of here, and then about 25 miles farther on horseback to see a man who wants an engine. After that I will return, and then go to Yorkville in South Carolina, and then I will return, and will then go to Anderson and Newberry in South Carolina. If I once get on my feet here, I will not have this running about to do, but will get a man to do it, and I will stay in Charlotte, except perhaps for a very occasional trip."

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"A great deal of interest is excited in my engine; but every purchaser wants someone else to try it first. I have ordered a small one sent from Pittsburgh; and I shall put it up in the gas works, and let it do their work, just to show that it will do what we represent."

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"The other machine companies are doing everything they can to keep me out of contracts; and, although I bid lower than any of them on this last contract, they put their bids right down to my figures to beat me. I will put some engines in soon in spite of opposition; and, once started, I feel sure the work will be easy."

. . . .

"I sold a 55 H. P. a few days ago to the cottonseed oil mill now being built in Charlotte, and got $1,025 for it. I will make about $80 on it. The price was $1,100; but I had severe competition, and I had to cut down my profit. The big machinery takes so long to deliver and set up. I don't collect a cent until I get some machinery running. It will take to August 1st to start this last engine."

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"Have just returned from a trip South. I sold two engines, and the prospect seems to be very fair for good work later. I shall put these two up. In one case the only specification made by the planter was that I might make my own selection of what he required; but he must have on his engine 'a big whistle,"

. . . .

"Rock Hill. I sold a large engine here a few days ago to the cotton factory, and we are putting it up. If it goes all right, it will be a splendid thing for me, both because it is a good sale and because of the fact it will be well known and a good reference. This is a small town 25 miles below Charlotte, which has a cotton factory and is growing, as in fact all towns in this community are. I am discussing with the Clifton factory near Spartanburg another sale of large engine."

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"Yesterday I started up the oil mill engine which was 65 H. P. It ran nicely and well."

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"I have been on a long trip into Stanley County; and if I went near a P. O. I do not know it. For miles I saw men and women without a sign of shoes, and passed several of the famous N. C. illicit whiskey distilleries. A negro drove me, and if I asked a white man if any whiskey could be bought, he would promptly answer 'No.' The negro would then assure him I was no revenue officer, but an 'Engine man'; then the fellow would not be so sure but we might find some if we tried. I asked one red-faced countryman if there was much profit in distilling, and he said there was. 'Did you ever distill any?' I asked. 'Oh, yes,' he said. 'Made money, I suppose?' 'No.' 'Why, you said there was good profit in it—how was it you made no money?' As solemn as a judge, he answered, 'I drinked up the profit, and more, too, and had to quit'."

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"I am doing a good deal of moving about. I have been two days in Robeson County putting up an engine."

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"For a couple of days I have been in Rome, Ga. I sold a large engine to Mr. Hammett of the Piedmont Company in South Carolina, and think I may sell an engine here later in the season."

. . . .

"I am now in a very critical period of my business here. I had not a large capital and thought best not to employ help until I got a start and some income. That has proved a good thing—for it has taken about this much time to get advertised, and I am just now beginning to get real busy."

. . . .

His business was now large and growing rapidly. He had built it up by himself. He was travelling salesman, local salesman, bookkeeper, mechanic, and machinist. He found customers, sold machines, and set up the machinery. The time was now come for larger organization. Looking over the city for a partner, he made a selection creditable to his judgment and reputation. For two years he had occupied a large storeroom jointly with R. M. Miller, Sr., a cotton commission merchant of character, credit, and business capacity, a strong, conservative, upright man, representing the traditions of the Old South. A partnership was formed under the firm name of D. A. Tompkins & Company, with R. M. Miller, Sr., president, R. M. Miller, Jr., secretary and treasurer and D. A. Tompkins, engineer. The company became general agents of the Westinghouse Electric Company and the Westinghouse Machine Company for their southeast territory.

Tompkins was now rapidly establishing a reputation, not only as a successful engineer, machinist, and business man, but also as a student of industrial forces and an authority on industrial matters. He was beginning to be recognized as a new and strong force in the industrial life of Charlotte.

Industrial promoters, writers, and students sought him out for instruction and inspiration. The editor of the Baltimore *Manufacturers' Record*, who at this time was passing through Charlotte on one of his annual Southern industrial tours, wrote for the *Record* an account of his first meeting with Tompkins: "'Have you met D. A. Tompkins?' were almost the first words spoken to me on a visit to Charlotte by R. M. Miller, Sr., a leading business man of that town. 'He is a remarkable young man, and I have been so much impressed with him that I have joined him in the establishment of a firm, with the view to backing his work with whatever influence my name may be worth.'" An interview followed between Tompkins and Edmonds wherein Tompkins was revealed to Edmonds as a close observer, a clear and profound thinker, and a farsighted prophet of the industrial South. His analysis of present conditions, his interpretation of the Old South passing into the New, and his vision of its great future were so clear, so striking, and so inspiring that Edmonds urged him to publish his views for the guidance and inspiration of Southern workers. The result was the following article, which in the light of the South's subsequent development seems almost a prophetic vision:

SOUTHERN PROSPERITY

"The South is in a state of change. A condition of civilization which grew upon the basis of the institution of slavery is dying and fading away. A condition of civilization based upon the new conditions imposed by the results of the late war has commenced to grow, and its growth is healthy and vigorous.

"There are tenacious people of fine education who are living in the dying conditions of ante-bellum life, some by obstinate preference, some of necessity. These constitute the Old South. They are, as a rule, growing poorer day by day, and will continue to grow poorer, until the most tenacious of them pass out of life; and with them will go the system to which they persist in adhering.

"The people who have adapted themselves to the new conditions imposed by the results of the Civil War constitute what we are beginning to hear called the New South. They have divorced from their minds the idea that for a Southern man there is no occupation but raising cotton with negro labor, and that free negro labor constitutes a curse to a country.

"The New South finds within the South unlimited raw material from which products required by the whole world may be produced. The New South finds that the conditions which surround these vast resources in raw material are such that only energy and good judgment are required to produce many articles of commerce cheaper and better in the South than can be done in any other country in the world.

"The New South is of healthy growth. It is already a young giant. It is absorbing the assets of the old, and adding to them at the same time by turning the raw material of the country, heretofore mostly untouched, into products from the sale of which come handsome profits.

"In the Piedmont region of North and South Carolina cotton factories are springing up quietly but with a rapidity equalled nowhere in the United States in any industry, except by that of iron-making in Alabama and Tennessee.

"While the opportunities of an iron maker in the South are excellent, it may admit of argument whether there are not many places in Pennsylvania or Ohio where they are as good, or better; but the superior advantages enjoyed by a cotton spinner operating in the South are conspicuous. Much cotton is now being spun in the South which comes direct from the field to a gin which is part of the equipment of the factory. This cotton is free from innumerable little losses to which cotton shipped to the New England States, or abroad, is liable, in the way of sampling, cost of freight, damage by careless handling in the mud, and otherwise, at railway stations, etc. The profits of Southern mills are evidence of these advantages.

"The only difficulty experienced so far in the development of the industry of cotton spinning in the South has been the lack of experience of proprietors and operatives. By the energy of enterprising men, this difficulty is being rapidly overcome. The late E. M. Holt, of Alamance County, N. C., was a pioneer. He was eminently successful in his efforts to operate machinery for spinning and weaving cotton. His sons seem to have inherited his energy and his enterprise, and each of them is largely interested in factories that have been established either by their father or themselves.

"In the same county Messrs. Scott, Donnell & Scott have demonstrated that a small factory may be as successful as a large one if it is handled with the same care and judgment. The junior member of the firm, Mr. John Scott, has taken hold of the work of the factory in a manner and with a success that make him a worthy example to other young Southerners whose businesses furnish neither sufficient occupation nor profit to satisfy them. He is neither afraid to work nor to be seen working.

"All along the Piedmont belt there are men who have attained to such success as entitles them to distinction. Notable amongst them may be mentioned D. W. Oates, superintendent of the Charlotte (N. C.) Cotton Mills, and R. Y. McAlden, of Charlotte, founder and proprietor of the factories at McAdenville. Both by handsome profits have increased the investments which were originally made at the factories they manage.

"In Randolph County, on Deep River, there are factories in quick succession, as we travel down the river—at Randleman, Naomi Falls, Worthville, Franklynton, and many others. Amongst the men who have contributed to the growth of these enterprises are John H. Ferree, T. C. Worth, and Hugh Parks.

"On the other side of the line of the R. & D. R. R. and in the same locality are the twin towns of Salem and Winston; and here we find many men of enterprise and much diversity of industrial pursuit. It is not to spinning cotton alone they give their attention. Messrs. F. &. H. Fries make an excellent cloth, and the neat suits of clothes they wear are made of cloth which is spun and woven in factories which they themselves have built and are actively engaged in managing. At this place also is a large interest in the manufacture of tobacco; and numerous factories have grown up in a few years. Haynes, Brown, Vaughn, and others have built large tobacco factories, and they utilize negro labor, and have found it profitable. Durham is another point where enterprising people have turned raw material into valuable product, and have created wealth out of what was formerly left by their forefathers as worthless. From Durham and Winston shipments of manufactured tobacco are made to all parts of the world. Tobacco alone is not the only manufactured product that goes out of Durham—cotton and wool are spun there, and in these latter enterprises J. M. Odell, of Concord, has interest, as well as the interests he has at his home in Cabarrus County.

"C. E. Hege, of Salem, is turning North Carolina pine wood into sawmills, which are being shipped to all parts of the United States, and in return therefor other products are coming into North Carolina. W. S. Liddell, of Charlotte, has within ten years built up a machine shop the total value of which is so much addition to the wealth of the states. He ships cotton presses throughout the South, and his cotton presses, sawmills, in fact most of his products are simply North Carolina raw material turned into finished and marketable machines.

"One of the neatest strokes of enterprise anywhere in the South was that of E. D. Latta, of Charlotte, in establishing about two years ago a factory for the manufacture of ready-made pants out of cloths woven mostly in North Carolina. His shipments are to Northern points as well as to Southern, and his factory would be a valuable addition to the enterprises of any town North or South.

"The above cursory references are far from giving an adequate idea of the extent to which North Carolinians are utilizing the raw materials of the State, and producing therefrom with North Carolina labor products the sale of which is making the State rich.

"The gold-mining interest is no small one; and at Charlotte the Mecklenburg Iron Works, a large machine shop, is kept largely occupied with the equipments of machinery for gold mines and the repairs connected therewith.

"In the western part of the State marble of fine quality is quarried; mica is mined in very large quantities. The mountain regions are becoming well-known and popular summer and winter resorts, not for the people of the State and the South, but for the whole United States.

"It is pleasing to note the diversity of enterprise, as exampled in the spoke and handle factories at Greensboro, the shuttle and shuttle block factories at High Point, in the preparation of barrel, stave, and spoke and felloe stock at Lexington and Thomasville. There are in operation in North Carolina more than 275,000 spindles; and the factories belong to and are operated by North Carolinians; and the number of their spindles is increasing.

"It was the intention in this article to speak more particularly of North Carolina, but, leaving the State and keeping mainly within the Piedmont belt, we find at Clifton, S. C., splendid properties under the management of D. E. Converse, and to his credit it may be said they are properties founded and built up under his management.

"Thirty miles farther westward is Greenville and Col. H. P. Hammett—with his Camperdown Mills and his Piedmont Mills and other properties, and he pays to his stockholders dividends, whether times are good or whether they are bad.

"Atlanta is full of enterprises and enterprising men, and the growth of that city is a fair example of the results of Southern raw material and Southern labor combined. Here, too, the diversity of enterprise is marked. Here it is possible to contract for the products of cotton or cottonseed. Here are the headquarters of marble companies supplying marble as fine as the Italian stone. Granite is supplied for paving the streets of cities to the north and west. Here are manufactured cotton gins, steam engines, and various machines used in the preparation of cotton for the market. In Macon, J. F. Hanson is the successful manager of two splendidly equipped cotton factories; and at Columbus there are the Eagle and Phoenix Mills, than which none in Massachusetts has been more successful.

"In Alabama, O. O. Nelson, of Montgomery, and George O. Baker, of Selma, have been foremost in the development of the new industry of crushing cottonseed for its products. And in connection with the growth of the iron interest the names of Doctor Caldwell of Birmingham, and A. H. Moses of Sheffield, are more than well known in connection with the growth of two cities and the marvellous multiplication of the original dollars invested by the corporations of which they are the heads. Both these gentlemen undertook the management of the affairs of the companies they now represent at a time when prospects did not look bright, and when the stock of the respective companies was not particularly marketable. Under their management the properties they control have increased in value more than any other properties in the United States have ever been known to do before. While these places stand conspicuous for their growth from almost nothing to marvellous wealth, other places have grown also, and other men in lesser degrees have done excellent work in Chattanooga, Anniston, South Pittsburg, etc., etc.

"With all this improvement and marvellous progress how is it that we now and then see in a well-written public journal that the South is growing poorer? It is because the editor lives amongst people who have not yet consented to give up ante-bellum ways and ideas. Many a man who formerly owned a hundred slaves and lived handsomely on a plantation is maintaining a slipshod semblance of the same sort of life, and is trying to raise cotton with free labor as he raised it with slave labor. He honestly believes he cannot afford to pay a negro laborer any except the most meagre wages, because he don't earn any more, and the negro in his turn is indifferent about whether he works or not, because he is so ill paid. The truth of the matter is that the average ante-bellum slave owner is a poor manager of free negro labor. Each year the labor is leaving the plantations and farms, and is being engaged in the new industrial pursuits.

"There are plantations within the writer's knowledge on which the amount of labor formerly employed was not less than fifty able-bodied hands, and on which to-day there is not a real first-rate hand, but only some half-dozen indifferent workers, and yet the families who own the places are still trying to maintain the appearances of the life they led when the place swarmed with slaves. They are growing poorer, of course, but an energetic man with a taste for farming could take the same place and make good wages and 50 per cent. per annum on the money value of the place, and that raising cotton, too, at 8 cents per pound. But to do it he would have to take the first row himself, and pay fair wages to a good hand to take the second. A large part of the white rural population in the South was formerly wealthy, and could control labor enough to support it without work. The conditions under which that was possible have passed away. The mineral resources and the industrial pursuits of the South have come into quick prominence. The ore and coal beds of Alabama have existed for centuries. To turn them into wealth was only a matter of judicious labor.

"The cotton which Southern people have only lately begun to spin with such profit has been here all the while slavery existed. It would seem that where an acre of ground can be made to produce a bale of cotton worth forty to fifty dollars with no more expense nor labor than a Northwestern acre can be made to produce forty bushels of corn worth fifteen dollars, that for the farmer the South is certainly the promised land even more than for the cotton spinner or iron maker. If farming were done in the South with the same method and energy that the iron maker or spinner bestows upon his business, it is beyond a doubt that its fame as a rich agricultural country would be not one whit less splendid than it was in days of slavery. A farm laborer should be paid for a year's labor at least the sum of money that would pay for his food and clothes while he was a slave, and in addition thereto a sum that would be a fair interest on the value of himself and family while slaves.

"The South stood once one of the foremost and richest agricultural countries in the world. The soil upon which she raises cotton now is the same as that upon which she raised it then. The prices obtained now are more than then, and the cost of labor now is less than then if the maintenance of slaves and interest on investment be taken into consideration.

"The next Southern boom should be a farming boom. The soil of the South is as superior to that of the rest of the United States as her mineral and forest resources are. Her climate is as fine as that in which ancient Rome attained the highest of all civilizations within the knowledge of history.

"The parts of the South in which the old is slowest to give way to the new are the very parts in which most success was attained under the old system. They have the most to unlearn. In the coast cities, which were formerly the centres of all the wealth, their engines are old and they abhor modern types. It is not realized that a gentleman and a mechanic may be combined in one man. It is in these regions also that the systems of farming is least changed, and it is in these sections that most of the peopl live who are growing poorer in the South. But as the natural wealth of the other parts of the South lay for a long time untouched, but finally came quickly into notice and was rapidly developed, s we have every reason to believe that all the lan formerly worked with profitable results may be worked again, and will be worked again with similar advantage.

"What is said regarding the increasing poverty of the plantation Southerner is said in no spirit of reproach. It is his misfortune to be a part of a system that is slowly but surely passing away. The labor upon which he formerly depended is gradually leaving him. Part of it is going West, and part is being absorbed by the cottonseed oil mills, the new railways, the tobacco factories, and the various other new enterprises being brought into existence by the new spirit of enterprise, as exemplified in the history of the successes of Hammett, Moses, Oates, Carr, and others. The Southern planter created the cotton-producing industry. By means of it alone he made the South rich and powerful. The system by which his success was attained fell with the institution of slavery. Entwined as our pride and affections are in the old planting system and all that is associated with it, we cannot see it pass away without regret; but as we look for success in the future we must recognize the fact that new ideas of life have taken a firm hold of the South; and, to succeed and prosper, we must spin cotton, or farm, alike, in the light of the new order of things.

The West never did offer the opportunity to accumulate wealth in farming that is now offered to any one in the South. Rich as her other resources are suddenly discovered to be, she was once rich as the result of farming; and it is idle to claim that there is less profit in working land by free labor than by slave labor. There would seem to be no reason why farm lands in the South to-day should not be one of the best of all the opportunities for investment she is offering."

This letter analyzes the South's industrial condition, and points the way of the New South—a new South of varied and intensive agriculture, of manufactures, of educated and skilled labor, of thrift and economy—a new South turning away from the sole business of cotton culture, and utilizing in manufacturing industries its vast and varied resources.

It was a favorite belief of Tompkins that the early South, during the eighteenth century and the beginning of the nineteenth, had surpassed the North in commerce, manufactures, and agriculture, and that Southern superiority had been destroyed by slavery. ion of slavery set free the South for a of industrial development. Tompkins saw career already beginning; and the vision of its fulfillment fired him with enthusiasm and patriotic ambition. He became immovably fixed in the belief that the South was capable of maintaining any industries and manufacturing any products that existed anywhere on the globe. This belief was the keynote of his life.

CHAPTER VII

BUILDER OF COTTON OIL MILLS

THE first large constructive work of Tompkins was to utilize a waste product of the cotton plantation. There was no wastefulness in the Old South more costly or more conspicuous than the throwing away of cottonseed. Heaped up in piles near the cotton gins, where they had been dumped out by the ginners, thousands of tons of seed, worth millions of dollars, lay rotting in the open air, applied to no use except occasionally a very limited use as crude fertilizer. Year by year the seed pile would grow, until it became a small hill, forming a feature of the plantation skyline. Tompkins in boyhood frolics with negro companions had played hide-and-seek or fought mimic battles on the big seed piles. He was now to utilize these mountains of waste.

The sale of an engine soon after his arrival in Charlotte was the beginning of a business connection which started him on a career to revolutionize and recreate the cottonseed industry of the South. "I landed in Charlotte," he writes in his memoirs, "about the same time as Fred Oliver. He was a native of Cohoes, N. Y., and came here from Paterson, N. J., with about $25,000 capital. He had heard of the oil in cottonseed and came here to investigate the possibilities that lay in this field. He bought the old flour mill building and converted it into a cottonseed oil mill. I sold him a Westinghouse engine, and this led to an engagement to help him construct the oil mill. In another year Fred Oliver with his brothers built a large mill in Columbia; and I designed and supervised the building of the mill as an engineering proposition. Thus I became launched in the cotton oil mill business."

At this time the cotton oil mill business was practically monopolized by the American Cotton Oil Trust. Tompkins was quick to see that the mills of the trust were below the standard of efficiency. Nor was he slow to profit by this condition. He resolved to organize a new company for the construction of new mills with new machinery. The story is graphically told by his fellow worker, Richard H. Edmonds:

"In the spring of 1886 Tompkins, on his way to New York, stopped to pay a visit to the *Manufacturers' Record* office. He was going to New York to sell a cottonseed oil mill to the American Cotton Oil Co., which had recently been formed and which was then buying up nearly all existing mills. He stated that while he questioned the wisdom of some of the purchases that company was making, he was acting for a client for the sale of an oil mill. It was, in his opinion, he said, impossible for that company to control the cotton oil trade; for modern, up-to-date mills could be constructed which in many respects would be superior to some of the mills the company was accepting. His views were so interesting that he was asked to write a series of articles for the *Manufacturers' Record* explaining how independent mills could be built and operated profitably in competition with the big combination. In a week or two article No. 1 of the series was received and published, with the announcement that it would be followed by other chapters. After waiting a week or two for the second instalment, urgent letters and telegrams brought another visit from Tompkins. He explained that the more he had studied the matter, the more he had become impressed with the possibilities of a new cotton oil company. The facts which he had prepared for the proposed series of papers had been turned into a prospectus for the organization of a company which he was endeavoring to form with $2,500,000 capital."

The article by Tompkins, above referred to by Edmonds, the first of a proposed series, is not only an interesting study of the Southern cotton oil industry as it then existed, but also a very interesting picture of Tompkins: his plans and purposes, his methods of thought and business, his powers of observation, analysis, and deduction. The article is too long to quote in full, but extracts will suffice.

COTTONSEED OIL MILLS—ADVANTAGES OF NEW MACHINERY

"Probably few large works have ever been constructed with so little engineering skill and so much useless expenditure of money as the average cottonseed oil mill; and there are probably few businesses wherein the cost of working a fixed quantity of raw material into product has been so great in proportion to what is actually accomplished as has been the case in the cottonseed oil business; but in spite of exorbitant first cost and excessive running expenditures, profits have, nevertheless, been large. Most of the mills built in the South were put up by a class of men known as millwrights and carpenters, who delighted in slow-running shafting and ponderous gear wheels; and the more complex the appearance of the belting, elevators, conveyors, and so forth, the more successful the result was considered. Only one mill built up to the present time can be said to have been built with any approximation to engineering economy and results; and no question exists but what it is far short of possibilities of improved construction and profitable operation.

"The best mill now running should produce products out of one ton of seed which will sell for $4.92 more than the products produced out of the same ton by an old and unimproved mill, and for $2.15 more than the product produced out of the same ton by an old and improved mill. New designs have been made, however, by which at least one dollar per ton still further may be produced in the shape of additional product.

"Besides this saving in price of product there is a similar saving in working expenses of old and new mills, so that, when a system of new mills would be running at anything near cost, the present existing mills would be running, as a system, at a loss of many thousands of dollars per day. Many operations done in the old mills by hand are done in the new and improved mills by machinery, and in a much better and cheaper manner.

"Competition will, of course, alter the price of oil; but a new system of mills could stand a far greater reduction than the old ones. In fact, with new mills running on prices which left no profit, the old ones would be suffering enormous losses.

"The owners of mills properly constructed could pay farmers three dollars per ton more for seed, sell oil to consumers ten cents per gallon less, and still make fair profits, under circumstances under which old mills would run at very heavy loss.

"A large majority of existing mills are practically under one management; and it may be assumed to be one of the specific aims of that management to prevent the construction of any new mill, and control the production and sale of cottonseed oil.

"The locations of many old mills were determined by local influences, such as the desire of local capitalists to build up a town, the enterprise of citizens at points not the most favorable for mills; and in many cases they are old mills constructed for other purposes and turned into oil mills, which cannot be economically adapted for the application of approved design and machinery, now possible to obtain for oil mill construction. Poorly built as the existing mills are, and badly situated as many of them also are, as above indicated, being under one management, a single mill could be forced out of competition without serious detriment to them as one organization.

"But with a capital of 5 million dollars there could be built twenty mills, of one hundred to 150 tons per 24 hours capacity, each at a cost of $125,000, and still have a working capital left of $125,000 for each mill also, making it unnecessary to borrow money at the high rate of interest now prevalent throughout the South. Locations should also be selected for these mills such that freight rates both for seed and product could be reduced far below present cost to existing mills. The cash cost of existing mills has probably averaged more than four times what mills could at present be built for at equal capacity; besides this original cost they have been pooled into a combination on terms and conditions, which is practically the equivalent of watering the stock to an unknown extent.

"It is probably fair to assume that any dividend which may be earned will be for division on a capital of 40 million dollars or over. The only ostensible property to represent this enormous capital is a lot of old mills, most of which should have been abandoned years ago, and would have been, except for the enormous profits in the business, and also a lot of old machinery. In fact, probably 90 per cent. of properties in the combination were fit to be put into the scrap pile when they went in. Whatever is the total capital of the combination, it represents properties taken in; and much evidence has been observed in proof of the assertion that none of it is in money.

"The capital necessary to build twenty mills, as indicated, would be 2½ million dollars; and with a cash capital of 5 million dollars there would be left 2½ million dollars for running capital. A company formed now would have the following advantages: a series of mills the best possible to be built in the present state of the art, all new, in the best possible location with regard to seed and freight; not a dollar in old and worthless property; ample running capital; on an average more oil per ton than the best mill now gets; seed at less cost per ton than the best mill now does; more concentrated organization; position to do the planter good instead of harm; low rate of insurance and the fact of being organized in the direction of benefit for the general public as well as for the benefit of the organizers, and not to force the public to pay an exorbitant price on a product in order to pay a dividend on a fictitious capital."

The ideas and plans thus outlined were carried out with perfect success. The undertaking was gigantic, not only in magnitude but also because the conditions of fulfilment demanded immediate completion. The company was organized as the Southern Cotton Oil Company, with Henry C. Butcher, of Philadelphia, president; Frederick Oliver, of Columbia, S. C., manager; John Oliver, of Columbia, S. C., secretary and treasurer, and Daniel A. Tompkins, of Charlotte, N. C., engineer. The story of the work is graphically told by Richard H. Edmonds.

"The money was soon raised. Some of the subscribers of the stock were great packing interests who were afraid to let their connection be known lest they should be discriminated against by the oil mill combination, upon which they then depended for their supply. One of them publicly denied any connection with the company, although a large subscriber to the stock. To meet this situation and make certain of providing an ample oil supply for these concerns, Tompkins determined that the new mills should be completed in time to crush the coming crop. It was then about March or April. Plans were put under way, draftsmen and engineers put to work to provide the drawings for eight mills to cost about $250,000 each. Sites were selected at several points in the Carolinas, Atlanta, Little Rock, and at some Texas towns. To design eight mills, to select locations at widely scattered and strategic points, to contract for buildings and machinery in April or May, and guarantee their completion by September or early October, was a task which, considering the conditions in the South in 1886 as compared with recent years, has not, I believe, been equalled since.

During the construction period I was occasionally in Tompkins' office, but he was too busy crowding the work to give the details. That fall his partner told me the story of the engineering and construction work, of the daily telegraphic reports that Tompkins got from every mill as to its exact status; and, as one mill after another was reported as completed, the message went back, "Turn on steam," and every mill moved off in perfect working order. That was an achievement rarely equalled even in these days, when the facilities for construction work have been multiplied many times as compared with conditions in 1886. In those days it seemed that Tompkins could have nearly, if not quite, equalled Edison in his ability to work twenty hours a day and sleep four. I have sometimes wondered if during that period he really knew a home except the sleeping car, and even in a sleeping car he must have been too busy planning and working grudgingly to have yielded up many hours to sleep."

This remarkable achievement was the beginning of a long career of cotton oil mill construction. It is not necessary to follow that career in detail. For twenty years as builder, designer, and investor, Tompkins promoted the cotton oil industry. As a missionary for cottonseed utilization he canvassed the South, addressing chambers of commerce, boards of trade, merchants' associations, farmers' conventions, legislators, capitalists, and teachers. Whenever and wherever an audience was ready he was ready to address them. Nor did he confine himself to speeches. By means of editorials, interviews, news items, and communications he flooded the press with articles on cottonseed mills, cottonseed fertilizers, cottonseed feed, cottonseed as the basis of dairying, tender beef from cottonseed meal, cotton oil for cooking, cotton oil for salads, and the like topics. His speeches and writings aroused interest everywhere. Mills sprung up in every Southern state. Whenever sufficient interest was aroused, he was ready with plans for mill construction. If capital was lacking, he helped to raise it. If necessity required, he furnished the entire capital. In some cases he aroused public interest by an address, procured stockholders, effected an organization, designed plans for the mill, supervised the mill construction, furnished the machinery, and installed it in the building, employed the superintendent, bought a year's supply of seed, and started off the mill—all without cost to the community. He dotted the South with oil mills.

But Tompkins was not content to build mills. He was constantly making improvements in mill buildings and mill machinery. He imparted his own enthusiasm to the mill men, and sought to enlarge their mental horizons. His address at the annual convention of the Inter-State Cottonseed Crushers' Association at Old Point Comfort, Va., exhibits his power, his enthusiasm, his vision of the evolution of cottonseed industries, his fine perception of economic relations between allied industries.

THE COTTONSEED OIL INDUSTRY

"It has been for a long time a sort of fashion to charge against people of the South a want of enterprise and energy. In many cases the credit for the very work which the South is doing is claimed by the people of some other section, and the idea put to the forward that alien money or alien talent is necessary for the success of a proposed enterprise.

"While no one has been more earnest in inviting capital to the South for profitable investment and talent for profitable employment, because of the ample room and opportunity for both, yet for the best interests of our home people and their children hereafter, it is not desirable for these to relinquish to others the foremost positions or the best opportunities.

"The cotton oil industry is one which has been developed, to all practical purposes, exclusively in the South and by Southern people. It is an industry in which the enterprise and energy of our home people are made manifest whenever self-reliance is one of the elements in the proposition. A people with less self-reliance and less steadiness of purpose could never have rescued civilization from the dangers that confronted it for a quarter of a century after the Civil War. In the production of the best and cheapest raw material for clothing and in such enormous quantities, and also in the development of such a splendid industry in producing food products out of cottonseed—the demonstration of the wonderful originality and capability of the people of the South has been made perfect.

No business men in America are entitled to more credit than the cotton oil mill men. You have brought out of nothing a business which you have developed into values reaching into millions. Even in the production of the crude products, oil, hulls, meal, and lint, the cottonseed industry has become one of very large proportions.

"Still greater advantages will come, however, from still further development, in which knowledge and skill and industry will change values by the barrel or by the ton into values by the pint and pound. The intensive system of agriculture is responsible for wonderful strides in that competition. By skilful and scientific manipulation an acre of ground is now made to yield three times the product of former years. The same intensive idea in steam engineering has made it possible to produce from a ton of coal three times as much power as formerly. The same intensive idea can easily wrench from a ton of cottonseed three times the present values.

"How to go forward to this goal is the problem we must all keep before us. First of all, we must look to the proper construction of the machinery and the building in order to reduce the expenses. The item of insurance is excessive. The oil mills in this part of the country pay an average rate of about 3 per cent. The very best of them do not pay less than three quarters of 1 per cent., and there are not a dozen mills in this class. Cotton mills, carrying on a business even more hazardous, easily insure for one fifth to one quarter of 1 per cent. Why this difference? It is entirely a question of construction and equipment. It is perfectly possible so to construct an oil mill and equip it with fire-protecting apparatus that it will insure as easily as a cotton mill. The same features of construction and management that conduce to low insurance also conduce to more cleanly premises, and hence a better grade of products. The condition of the average oil mill, as to cleanliness, is something appalling. When it is considered that practically all of the products are for food, and a large part food for man, the filthy condition of most mills is a lasting reproach, and will help keep alive the prejudice against cotton oil as an article of food.

"But the greatest step toward increasing the profits lies, of course, in continuing the processes to greater refinements and diversifying the products, making a more finished article for the market. The usual process of refining yields 'summer yellow.' If this process is conducted with sufficient care and skill, the result may be called 'butter oil.' If this oil be properly manipulated with other materials, a fine butter substitute may be produced and sold direct from the mills, instead of shipping the oil to Holland to be manipulated and sold from there. If the oil is properly treated, the finest salad oil may be made. This is a mere matter of skill. Ten years ago it was as difficult to find even an ordinary refiner as it now is to find a first-class one. More attention is now being paid to our education in these lines, and it should not be long before we can find sufficient skill to make table oils equal to those of Europe. We now export $12,000,000 worth of oil, half of which goes to France, where it is refined and manipulated to suit the palates of a population accustomed to olive oil. It ought to be and is possible to make salad oil here from cottonseed which is superior to imported olive oil, for the reason that we can always have fresh cotton oil, while the imported oils must of necessity be older. The matter of freshness is, in the present state of the art, a most important one. Certain changes take place in oils with age no matter in what way they are kept. The changes are always for the worse, and tend toward rancidity. It is not impossible, however, that a way may be found to remedy even this trouble. A wide field is open for the manipulation of oil so that when it is used for cooking there will be no disagreeable odours. Great progress has been made in this line, and several companies now claim to turn out such products. But the best of them fall far short of perfection.

"The manufacture of fine soap is an important direction to look in. A number of mills now make a crude soap from their refuse products and some make good laundry soap from refined oil. It is but a step farther to make fine toilet soap. There is a wide difference between the best laundry soap which sells at 5 cents per pound and some French toilet soaps selling at $1.50 per pound. The difference is mostly a matter of skill and knowledge, and but slightly a matter of raw material. In the manufacture of soap an important by-product is glycerine, which itself is capable of great degrees of refining, and which, if handled to the limit, would add greatly to the value of the output. It is difficult to set any limit to which the chemical end of the business may not be worked.

"A much more simple branch of the business, and one which we already have the skill to prosecute, is the proper disposition of the hulls and meal. Fifteen years ago hulls were burned as a fuel. Their fuel value is from 50 to 75 cents per ton, according to the price of coal in the locality. We now sell hulls as a cattle food at $5 per ton, and would consider it idiotic to burn such a valuable foodstuff. But yet we bury in the ground a large quantity of cottonseed meal, calling it a fertilizer, when it really is a foodstuff, just as we once called hulls a fuel. There is no more denying the fact that meal will act as a fertilizer than there was, or is, that hulls will act as a fuel. But on the same reasoning we might call rosewood a fuel, or cottonseed a fertilizer. It is a question of valuation for the purpose. On the present market the experiment stations give a fertilizer's valuation to cottonseed $10 per ton and cottonseed meal $20, while we know that cottonseed has a value in its mill product of $20 per ton, and the experiment station valuation on meal as a foodstuff is $35 per ton. Hence it is more profitable to take meal out of the fertilizer class than it is cottonseed itself.

"In transferring meal from the fertilizer class to the foodstuff class a most curious result occurs, nothing less than the creating of a fertilizer value after feeding, which is about equal to the original fertilizing value of the meal. Mr. Edwin Lehman Johnson, of Clemson College, has made a special study of this matter, and he gives the results of some actual experiments as below. He fed five cows on cottonseed meal and hulls.

Meal, 20 lbs. per day at $20	.20
Hulls, 80 lbs. per day at $3	.12
Cost of daily ration	.32

They excreted 177½ pounds, which, when air dried, yielded 59 pounds, having a valuation of $0.297. The cost of all the feed per animal was $0.064. The fertilizer produced $0.059. Hence the animals were sustained and fattened at a daily net cost of half a cent. The value of the excreted fertilizer was 93 per cent. of the cost of the food.

It is found that a steer weighing 1,000 pounds may be fed for 100 days on a daily ration of 6 pounds of meal and 24 pounds of hulls, and gain about 300 pounds in weight. If the hulls from a 10,000,000-bale cotton crop (say 4,000,000 tons of seed, besides planting seed) were used in this manner, they would feed 1,600,000 cattle for 100 days. The meal would feed 4,000,000 cattle. Thus by supplementing the hulls with some other rough forage from the farm, it is seen that the products from one ton of seed will fatten one steer.

"It is a great mistake for the Southern States to be so much in want of good beef that they bring immense trainloads from Chicago, while they have at their doors enough of the best possible feed for more than a million beef cattle. The full appreciation of this condition will work wonders for the prosperity of this section. Systematic cattle feeding will induce systematic butchering, which will develop into packing houses. Packing houses diversify their products to an endless degree. We shall then have a logical plant, using cottonseed as a raw material. The beef cattle fattened on cottonseed products will produce fertilizers for the enrichment of cotton farmers. When slaughtered, they will yield tallow and oleo, which may be mixed with cotton oil for lard compound and butter substitutes.

"The cotton oil business in some degree of intensified development is as important an adjunct to the farm community as a ginnery. There is room for a small plant in every cotton-producing community. It has been the fashion in the past for farmers' movements to oppose oil mills. But it may easily be seen that a thrifty community derives great profit from the oil mill, and nothing will more quickly tend to bring about a full understanding of the matter than the extensive feeding of cattle. And this very condition will enhance the fertility of the soil and advance the condition of the farmer. It becomes, therefore, clear that there are ample fields open for the further development of values out of this business that are and may become auxiliary to it."

After locating mills in the industrial centres of the cotton-growing states, Tompkins began a campaign for small mills in rural districts. "There are great possibilities," said he, "for small country oil mills. They are in proximity to the raw material, and are relieved of freight rates both on the raw material and on most of their products. The oil that may be extracted from cottonseed by the processes now in use constitutes but 15 per cent. of the whole weight of the seed. Hence, if a mill can buy seed from wagons at its doors and sell its meal and hulls over the counter, so to speak, it has saved freight on 100 per cent. of raw material and 85 per cent. of finished product. Working on this basis, and not attempting to operate a mill larger than can supply and be supplied by its wagon territory, there is every hope of permanent success for country oil mills. They are analogous to the cotton mill in the heart of cheap cotton territory, manufacturing coarse goods at 10 cents per pound, where the cost of cotton at 6 cents is a large proportion of the value of the product. They have almost a prohibitive advantage, on this particular line of goods, over competitors in other districts where high prices prevail for raw material. In the entire cotton-growing area every community must have its oil mill. The big ones (60 to 300 tons capacity with refineries) and the little ones (20 to 60 tons capacity with cattle-feeding and fertilizer departments) both have ample room for operation."

The crusade for cotton oil mills in rural districts was waged with his usual energy among the planters and farmers of the South by speeches, lectures, newspaper articles, and circular letters; and was attended with the usual results. The story of this work is told by himself with characteristic modesty, no hint being given of his own agency in the work.

"During the last spring and summer no less than a hundred new oil mills have sprung up, the average size being thirty tons of seed per day. Previous to this year there were about 300 mills, averaging in size about seventy tons. This year's addition is equal to 33 per cent. of the whole number of mills and 14 per cent. of the whole crushing capacity.

"Prominent among the causes leading to the great increase of small mills is the increased country demand for cottonseed products. No business has been better advertised and none more systematically investigated and fostered by the general government and by the several State governments. Agricultural bureaus and experiment stations of each of the cotton-growing states have made exhaustive scientific and practical investigations of the products, with the result of unanimously approving of them and recommending them.

"Fifteen years ago cotton planters were congratulating themselves on finding sale for cottonseed, which had hitherto been thrown away, and which had been a positive nuisance. But at that very time the oil mills had cottonseed hulls on their hands as a waste product and a nuisance. They were utilized as fuel to run the mills, but even that did not consume them all. Compared with the average price paid for coal, cottonseed hulls are worth for fuel less than $1 per ton.

"During the past ten years it has been demonstrated that the real value of cottonseed hulls is as a foodstuff for cattle. As such the true value ranges from $4 to $10 per ton, according to the prevailing price of other foodstuffs. The large mills have made great efforts to promulgate this fact, and have even fed large herds of beef cattle on their own account for the purpose of utilizing the hulls and for advertising their value, so that now the value of all cott seed products is well known in the most rem districts.

"With the understanding of the uses of cott seed meal and hulls as foodstuff for cattle there ca an increasing demand for these products from country districts. And then the country distr began to discover that they were shipping away t cottonseed and buying back only a part of th and paying out, counting freights and hauling, ab as much as they received for the seed. Thus idea of country mills took firm root." You wo never suspect that the writer was himself the miss ary of this campaign and the chief builder of the m

His career as a builder of cotton oil mills modestly credited by Tompkins to his teachers, ployers, and associates:

"Just after I had left the South Carolina Uni sity, General E. P. Alexander built an oil mil Columbia, but it failed for the reason that the fa ers would not haul their seed to market and sell th Gen. Alexander's efforts were the first impor efforts on an engineering basis; but the General a military man and not an industrial man; and, sides, this was a little too early for the farmers, had to be trained a little before they would sell t seed.

"My connection with the first oil mill at Charl led to my undertaking other contracts, and second mill I built was in Columbia within a b of where General Alexander's mill had been built think the oil mill I built at Columbia for the O Brothers was the first oil mill that was ever bui engineering drawings; and the plans of it are sti use. In these plans I incorporated ideas of Ale der, Holley, Fritz, and Westinghouse. It was more or less accidental that I was able to incorporate the ideas of four such good men; hence, the success of the first effort.

"Methods which Mr. Holley had used in introducing the Bessemer process served me well in developing the cotton oil business. He organized a company and helped raise the capital to build a steel works. Long afterward throughout the South I helped to organize companies and helped to raise the capital to build cottonseed oil mills. Through a period of twenty or twenty-five years or more I was very much occupied in introducing the cotton oil industry into new sections.

"I asked my treasurer the other day how many oil mills we had built, and he said about 250, all told. This seems almost incredible, but besides the mills I built myself a number of others were built from drawings I made."

The U. S. census for 1900 (Bulletin 190, by Henry G. Kittredge) strikingly emphasizes the importance and the growth of the cottonseed oil industry:

"Closely allied to cotton manufacturing is the cottonseed oil industry, in which there has been a great revolution within late years in the utilization of the cottonseed, in obtaining most valuable commercial by-products, that were at one time allowed to go to waste with the seed in the form of manure. Cottonseed was a garbage in 1860, a fertilizer in 1870, a cattle food in 1880, a table food and many things else in 1890.

"The manufacture of cottonseed oil and all of its resultant by-products furnishes one of the best examples of development based upon the utilization of a waste product. Eventually the entire cottonseed crop will be worked through the cotton oil mills the exception of the amount reserved for plant

This prediction is now fulfilled; its a plishment is due chiefly to Daniel A. Tompkins may justly be called the Father of the Sout Cotton Oil Industry.

CHAPTER VIII

BUILDER OF COTTON MILLS

THE building of Southern cotton mills for spinning and weaving was a long-cherished purpose of Tompkins. He says in his memoirs, "While I was yet in the North, working as machinist and draftsman in the Bethlehem Iron Works, I wrote many times to machinery builders in New England about the possibility of establishing cotton mills in the South. Poor as the South then was, I was impressed with the fact that she was indulging in cut-throat competition in the almost universal process of cotton raising. I thought that if a portion of the people could go to the manufacturing of cotton instead of raising it, the result would be a better market for the crop and a better price. It seemed wonderful to me how wedded to one pursuit the South had become through the institution of slavery and cheap labor.

"When there was added to this the confusion and iniquity of the reconstruction period, it was more and more clear that what the South needed was for her white folks to go to work and increase their manufactures in any way available, in order to relieve the competition of cotton production. I thought if these new principles could be introduced, the South ought to become a very prosperous country. It was because of this opinion that I gave up my work in the North and went South again."

When Tompkins returned South the development of manufactures had already begun in many directions, as indicated in his letter to the *Manufacturers' Record*. Industrial plants were springing up here and there for the manufacture of cotton, iron, lumber, tobacco, and other raw material; coal and other minerals were being mined; truck farming was growing rapidly in extent and efficiency; railway and steamship lines were developing; and the banking business was extending its power and usefulness.

But cotton industries, while growing steadily, did not arouse popular enthusiasm, for their influence on the popular imagination had been more depressing than inspiring. A cotton mill was not regarded as a desirable acquisition in the average Southern community. Aristocratic ideals of leisurely life on large plantations dominated social sentiment and even the "poor whites" preferred a scant existence as free yeomen in the fields or woods to more lucrative employment in cotton mills. Their ideas of freedom were repugnant to the confinement and the continuity of work in cotton mills. Southern leaders generally were not hopeful of industrial progress based upon cotton industries. The overthrow of slavery seemed to foreshadow the overthrow of cotton. Although the cotton crop was steadily increasing, its value did not increase. The general despondency about cotton was so great that some writers maintained that "it was and always had been a curse to the South, and the South were well rid of it forever."

Not so Tompkins. Although he had long resolved upon a career in iron, a resolution based upon natural inclination and early training in his father's black smith shop, a resolution strengthened and confirmed by his long apprenticeship in the Troy and Bethlehem Iron Works, yet, when he stood facing the great problem of Southern development, he reasoned it out that cotton, the South's greatest product in the past and the basis of the power of the Old South, was the natural basis upon which to build the New South of manufactures, commerce, and diversified agriculture. Having reached this conclusion, he gave himself heart, soul, and body to its fulfilment. The ideas involved in it he elaborated, exemplified, illustrated, and proclaimed to the world, in a thousand ways, on a thousand occasions. He never ceased to think, write, and talk cotton.

"Cotton is king again," he declared; "Not cotton in the fields but cotton in the mills.

"Not only is cotton the world's greatest plant, but the production by the South of ten million bales of cotton in one crop is the world's greatest agricultural achievement.

"The cotton plant supplies more of the necessities of the human race than is supplied from any other single source.

"Food, clothing, and shelter; these are the prime needs of mankind. We have now from the cotton plant the following:

"1. *For Food.*—Cottonseed oil, which, when pure and well refined, is in all respects equal to olive oil, and when it contains 10 per cent. of olive oil, simply to give it a flavor, cannot be distinguished from olive oil even by experts. Cottonseed meal, as food for cattle, sheep, and many other animals; in this way it contributes to our supply of beef, mutton, milk, butter, wool, etc., etc.

"2. *For Clothing.*—The infinite fabrics that are made of cotton for human clothing, domestic articles, wadding for clothes, quilts, etc., etc.

3. *For Shelter.*—Tents, awnings, and sails of ships, roofs of houses, etc., etc."

Wherever opportunity presented, he proclaimed these ideas. He spoke in every Southern state to gatherings of business men, capitalists, laborers, planters, farmers, teachers, and politicians. His contributions to Southern newspapers were almost endless. With energy, enthusiasm, and ceaseless activity he waged an industrial war. He was as tireless as a general in charge of actual war. His speech in Atlanta before the Southern Industrial League, a fair type of his speeches during this campaign and a model of patriotic appeal and logical argument, sets forth briefly but clearly the possibilities of cotton manufacture in the South.

COTTON MANUFACTURE IN THE SOUTH

"A passenger once fell overboard a Mississippi River steamboat at a point where the river was about two miles wide and looked as though it might be a mile deep. The man couldn't swim, and was naturally very much frightened. He was floundering about, and seemed in imminent danger of drowning. The pilot from the first kept shouting to him, 'Stand up!' and when he finally did make him understand, and the man stood up, he found that the water was not over knee deep.

"Many of our troubles are very much like the troubles of this man. If we knew the surroundings, or could in any way find out just what to do, we would be able to escape a sea of trouble by simply standing up. The purpose of my talk to-day will be to show that the life-saving thing for the cotton farmer is the cotton factory.

"The South is in a period of transition. Whoever fails to recognize this fact not only hazards his success in life, but does serious injustice in misleading his children.

"In the period immediately succeeding the Civil War the people of the South suffered least from the loss of their property. In that succeeding period, lasting from one to two decades, there was an unceasing struggle with anarchy amidst the wreck of former conditions. The contrast tended all the time to waste the energies and destroy the hopes of a people who in more ways than one have exhibited a most enduring courage.

"Those adverse conditions are all past. The worst of them began to pass away about two decades ago. At the beginning of the Spanish-American War they had faded into insignificance. Before the end of that war the last of the shadows had disappeared. The South has now reached that condition in which she has the prospect of as perfect freedom from disorder and uncertainty as ever before in her history. The time has now come for us to take our bearings, see where we stand, and lay out our course for the future.

"Naturally the cotton plant appears as the basis of our most extended industries. We could not export seed cotton, and so we developed a large ginning interest to put our cotton in marketable shape. Now we are realizing that ginning the cotton is but one short step toward putting it in the most profitable shape for market.

"Ten million bales of cotton in the seed has practically no market value in that shape. Put up in ginners' bales it has a local value; put up in compressed bales, it has a universal value of say $400,000,000. Manufactured into fine sheetings, at the present market valuation, it would be worth $1,200,000,000, an increase of 200 per cent. Manufactured into fine organdies, it would have a value of $12,000,000,000, and in finer goods, still more.

"Of course the world would not take the entire crop in the shape of any one kind of goods, but it will take it in the manufactured state, in some of the manifold styles intermediate between the above values, so that it is safe to say that a 10,000,000-bale crop is ultimately retailed as cloth for $5,000,000,000.

"The question to be settled by the communities which produced this raw cotton is: How much of it they are willing to part with at $40 a bale, when it ultimately sold at $500. And up to what price per bale are they prepared to bring it by their industry and skill in manufacturing?

"Cotton is now, as of old, the great resource of the South. We make in round numbers 10,000,000 bales yearly.

"This, at six cents per pound, yields $300,000,000. Years ago 5,000,000 bales at twelve cents also yielded $300,000,000. These figures naturally bring us to ask ourselves what gain have we made in producing 10,000,000 instead of 5,000,000 bales. They lead us to talk and write about curtailing the production in order to stimulate the price.

"As a matter of fact, the production of 10,000,000 bales of cotton, where we formerly made 5,000,000, is an immense gain. It is only by producing more and more cotton at cheaper prices that we still control the cotton business of the world. If we should produce less, or if we could stimulate the price, the cotton supply of the world would be furnished by other countries. India is pushing us closer to-day than ever before in the production of cotton. The stimulated price would at once stimulate the production in India, Egypt and South America, Turkestan and other countries. The world needs an increasing quantity of cotton, and there are other people in the world who have suitable land and who will supply the demand at current prices if we do not do it.

"If we rely upon cotton production alone we have before us the prospect of being under the necessity of increasing crops at cheaper prices. Failing in this. we must lose the monopoly. But it would seem to be useless to fight to hold a monopoly that means more and more work for less and less money.

"If we stop with the production, the prospect is not bright; but by the manufacture of this cotton, and finding markets for the manufactured article every class of people in the South is immeasurably benefitted.

"Let us assume that an average Southern state produces 1,000,000 bales. This crop at six cents would yield $30,000,000.

"If made into cloth worth an average of eighteen cents, the yield would be $90,000,000, yielding a profit to the state of $60,000,000.

"This profit would be almost entirely in the shape of actual money coming from foreign markets or other parts of this country. Much of it would go for wages of course, but it would go to home people who have now scant opportunity to make wages. Much of it would go for foodstuffs that the working people would consume; but the farmer would get this money for potatoes, chickens, eggs, butter, milk, fruit, and a lot of other perishable stuff which now rots on the farm for want of a market, or which might be made, but is not, for want of a market.

"Out of the increased supply of money brought into the state the farmer would probably get the greater proportion of it all. The price of cotton to a farmer is always a little better in a factory town than in an ordinary cotton market. The farmer would, of necessity, get the money paid by the operatives for almost their entire living.

"The average price of eighteen cents for manufactured goods is about what the cloth would be worth in the shape of plain white cloth and ordinary plaids and ginghams. This price is by no means the limit of what might be reached. With knowledge and skill cotton can be put into cloth worth thirty-six cents, seventy-two cents, and even still higher figures.

"We have seen that a crop which in the raw state is worth $30,000,000 easily may be made worth $90,000,000. This same crop at thirty-six cents would yield $180,000,000, and seventy-two cents, $360,000,000, or more than the entire crop of the South is now worth in bales at current market prices.

"Nothing is necessary for the accomplishment of this result except intelligent thought and persistent labor. The labor now wasted in the South is something appalling. As the more intelligent and responsible element of our people were formerly discouraged by the anarchy that succeeded the Civil War, so all labor in the South became discouraged for want of regular work at fair cash wages. There is now no longer excuse for either of these conditions. The intelligent and responsible part of each community ought to formulate plans to take hold of some manufacturing interest to an extent to engage their own time and talents, and to furnish regular and profitable occupation to home labor. Then discourage all habits of loafing, and any working community cannot help but prosper; but so long as the loafing habit lives in any community, there can be no prosperity in that community.

"We all know that a great number of farmers now work scarcely one hundred days in the year. With this much labor they produce a cotton crop. The factory employee works three hundred days in the year. This leaves the farmer with two hundred less working days than the factory operative. With a ready cash market for all perishable farm products there would be ample encouragement for the farmer to fill out his three hundred days with some profitable work. This additional work would not be drudgery, nor unpleasant. It would, of course, be work to drive into town with a lot of fruit, vegetables, and other farm products, and sell them out in a factory village for two, four, or more dollars; but there is nothing unpleasant or irksome about such work, and the various sums so obtained, and obtainable any day in the year, would help out mightily in producing cotton at a price that would compete with the India man and the Egyptian. In fact, in the southeast, where the manufacture of cotton is well-established, many farmers make more money out of their miscellaneous crops that they sell to the factory population, than out of their entire cotton crop.

"If we contemplate the manufacture of the entire crop of the South, the figures become stupendous. For example:

10,000,000 bales at 6 cts. per yard.	$ 300,000,000
10,000,000 bales at 18 cts. per yard.	$ 900,000,000
10,000,000 bales at 36 cts. per yard.	$1,800,000,000

"For any such results as these we have not yet the population. Even that part of the population we already have would need much in the way of education and training before any very large proportion of it could be put to work. But the figures show what an opportunity is before us. Each of us ought to do our utmost for the promotion of manufactures and for the education and training of the coming generation in the manufacture of cotton.

"The sentiment in this direction is growing conspicuously. I attended not long ago a meeting of the Southern Press Association held at Richmond, Va. This subject of growing interest in industrial development was discussed at length, and it was the general sentiment that the rules as to what constituted news needed revision. In the past the rule was that murder, rape, arson, and politics were news. It was agreed that in the future the rule should be that Christian progress, education, manufactures, and commerce should be news. The idea is that beneficent works rather than crime shall be news.

"It is a growing idea that as the papers follow up their work in the lines indicated a great move will be made in the dissemination of reading matter that will benefit the people instead of that which feeds morbid taste.

"As to our production. All the cotton now made is manufactured by somebody. The world's requirement seems to be increasing, and we seem to be as well situated to make the yarn and cloth as to produce the cotton. It would seem as if the limit of our manufacturing interests is simply the labor we have, and can get, until we manufacture all our own production. Such an ultimate result could only come after long time and after vast improvements in our educational system. But the opening is ready for an immediate beginning, and is wide open for indefinite development.

"The undertaking of turning all our cotton into cloth is not as great as would at first appear. The factories in North Carolina now manufacture about 300,000 bales of cotton into cloth and yarn a year. For this work there are employed in round numbers 30,000 operatives. This work is done with about one million spindles. It must be understood, of course, that I speak in figures that are even and somewhat approximate, but that are near enough the exact figures to illustrate this argument with reasonable accuracy.

"In order to manufacture the entire cotton crop of the South into plain white and coarse colored goods there would be required something like 30,000,000 spindles and 1,000,000 operatives. The population of the Southern States may be reckoned at 20,000,000. Does anybody doubt that out of this 20,000,000 there is idle time enough wasted, even by those who would be willing to work, to furnish 1,000,000 good operatives in cotton factories? Go into any ordinary cotton market town where no cotton factories have as yet been built, and at any time from 7 A. M. to 10 P. M. count the people who are loafing, and the number found would more than make up the quota of people for its share of the workers necessary to manufacture the cotton crop. This loafing habit; this superabundance of people who are capable of working but who are loafing in the country and in towns where there are no factories, is conspicuous by comparison with the town where manufacturing enterprises have been established. By the same comparison the dilapidation of the houses is conspicuous; the poverty of the farmers in the adjacent country and the wretched condition of the roads are more than conspicuous.

"Happily these old conditions are passing away. In many sections they have already passed away. The people of the South are naturally enterprising and resourceful. In the early days of the republic the South was the manufacturing end of the union. The first steamship ever to cross the ocean went out of Savannah. The South Carolina railway, when it was building, was the greatest engineering enterprise of the world. According to the United States census of 1810, the manufactured products of Virginia, the Carolinas, and Georgia, exceeded in value and variety those of the entire New England States. This is mentioned in no disparagement of New England but rather to show that our forefathers were men of enterprise and that they had confidence to venture on their own judgment. They never waited for somebody to come from somewhere and develop their resources for them. If they thought a cotton factory or a railroad would be a good thing they built it. The only mistake they made was in thinking that the colored brother as a slave was a good thing. The growth of slavery dried up a well-developed manufacturing tendency in the South.

"Now slavery is gone, the last vestige of that anarchy that succeeded the Civil War is also now gone. Wherever the people have recovered something of the confidence of their forefathers in enterprise they have prospered beyond their own expectations or hopes.

"The South has put the manufacture of iron on an export basis. The cotton oil industry has been developed on an export basis. The South has in these things set the pace and made the prices to which the manufacturers of the North must go and come. If we but utilize the resources we now have, and put to work the idle labor now in every undeveloped section of the South, we may supply from cotton-growing states the cloth for the vast markets in different parts of the world that are now furnished from the manufactories of England and Germany.

"In all that we do we want to coöperate with and not antagonize our friends in New England and other parts of the North. For the sale of our goods we must rely much upon the development of foreign markets. In the future it will not be a domestic fight over home products. The foreign markets we must seek give outlet enough for the products of the North and South both. It is important that the people of the whole nation shall work together to acquire and develop these markets.

"Practically all native people in the South are farmers. The manufacturing now being done by Southern people furnished evidence of the facility with which the Southern farmer extends his operations. Almost every Southern man who has gone into manufacturing is still a farmer, and will continue to be so. The escape of the cotton farmer from approaching poverty is not in trying to curtail production and increase the price, but in devising means to keep the cheap cotton at home, and utilizing surplus time in turning it into cloth worth eighteen cents and upward per pound.

"For more than a quarter of a century the political and social conditions in the South have been very unfavorable for the development of material interests. The generation that is now passing away has withstood a test of Anglo-Saxon civilization—fighting against the strong prejudices of other people of their own blood living at a distance, and against semi-barbaric influences at home that were supported and urged on by those prejudices. This contest is well nigh over. It is no wonder that during its progress so little advance was made in material prosperity; but it is a wonder that the production of cotton has kept ahead of that of other advancing cotton-growing countries. This result alone, together with the saving of civilization and the preservation of the social status of the South, shows the ability of the people of the South to carry to the maximum limit the white man's burden. In the same time Egypt and India, both under English control, have been pushing forward in the production of cotton, becoming our serious competitors.

"For the coming generation the way to prosperity is wide open and plain. The passing generation has won the fight against anarchy and left to their children a heritage more valuable than any riches. It is now simply a question of redemption from poverty. To do this we must combine farming and manufacturing. The factories will require operatives, who in turn must have foodstuffs, which will make a market for the farmer's supplies. Cotton can then be made cheap, because diversified crops, which can be sold for cash, will bring in a supplemental income. Indeed the time may come when cotton will be the surplus crop instead of being, as now, the main crop.

"It is my firm belief that in the near future no community can afford to be without its cotton factory, its cottonseed oil mill, and its fertilizer works. With these the cotton may be tripled in value, the cottonseed tripled in value, and the farm tripled in value.

"Now let us formulate what the farmer ought to do about this matter of cotton manufacture. Most of them are not in position to build factories; yet the subject rests almost entirely in the hands of the farmer. I formulate the required action necessary by farmers as follows:

"1.—Create and maintain an untarnished credit. Keep all contracts inviolate and sacred. The commercial strength of England lies more than in any other one thing in the perfect faith which England and the English people maintain with those with whom they deal. The true Englishman never repudiates an obligation, even though he gets nothing in return from what he has contracted to pay for a railroad that was never built. I hold, however, that if the debt was honestly created and the chances taken, it is both good moral principle and good investment to fulfil the promise.

"If we would turn our cotton into cloth, we must, of necessity, go into the markets of the world, and a reputation for fair dealing and fulfillment of all contracts is the first prerequisite to an established trade with the miscellaneous nations of the world.

"2.—We must develop and maintain our shipping. We must have a merchant marine and a navy to protect it. We have reached that point in our industrial development when, if we extend our manufactures further, we must have more markets. You have built railroads by subsidies. There is hardly a town, county, or state that has not contributed in bonds or in money or in lands or the use of streets to the construction of one or more railroads. Almost every railroad in the United States has had more or less bounty money to aid in its construction. Towns vie with each other to-day in offering bounties to obtain new lines of roads, and everybody feels that it pays to do so. Yet there is an incomprehensible prejudice against giving even a fair mail contract to a new line of vessels to a foreign country. England and Germany are willing enough to send their subsidized ships here after our five-cent cotton. They will never permit them to come for our fifteen-cent cloth. These countries want to hold the manufacture and hold the trade. We must have our own ships, as we must also have a navy to protect them.

"3.—Wherever there are markets for our manufactured goods we need American banking facilities. We must have a money upon which the people of all the world can rely. The American five-dollar bill must, at all times and under all circumstances, be as good as the English pound sterling.

"The farmer by his influence and vote can bring about these conditions. In bringing them about he is multiplying by three the value of his cotton and tripling the value of his lands. It is in this way that the monopoly in the production of cotton can be held. It is the way prosperity can be brought to the South, and maintained for all time.

"The Civil War made your fathers a poor people. The quarter-century fight you have made for civilization has made you a sturdy, self-reliant people. The prejudices of those of your own blood throughout this period of anarchy and disorder have made you a patient people. The year of jubilee is now come and the time is ripe for the farmer to join hands with the manufacturer.

"Help to establish manufactures at home, and help to get foreign markets and ships and bring back from abroad three dollars and upward where we now bring back one. Add to the heritage of Anglo-Saxon civilization which you have saved for your children a combined system of farming and manufacturing with the necessary facilities for a world-wide commerce, so that they may become rich and prosperous as their grandparents once were."

Tompkins possessed in a high degree talents for thought, for speech, and for action. Had he confined himself to a single career, he might have achieved eminence as a public speaker, as a writer on political economy, or as an industrial builder and promoter. With a calm philosophy worthy of Lincoln he says, "The Civil War made your fathers a poor people. The quarter-century fight you have made for civilization has made you a sturdy, self-reliant people. The prejudices of those of your own blood throughout this period of anarchy and disorder have made you a patient people." With the joyful enthusiasm of a preacher he shouts, "The year of jubilee has now come and the time is ripe for the farmer to join hands with the manufacturer." With the practical wisdom of Franklin he says, "Help to establish manufactures at home, and help to get foreign markets and ships and bring back from abroad three dollars and upwards where we now bring back one." He concludes his great speech with a tribute to Southern fortitude in defying the Reconstruction policy of Northern fanatics and with a patriotic appeal to Anglo-Saxon ideals.

CHAPTER IX

BUILDER OF MACHINERY FOR COTTON INDUSTRIES —THE D. A. TOMPKINS COMPANY—HOW TO BUILD UP A BUSINESS

THE building of cotton mills and cotton oil mills was carried on by Tompkins during a period of twenty years and was extended throughout the South. It was greatly facilitated by his work as a builder and distributor of mill machinery and mill supplies. The D. A. Tompkins Company, of which he was president and general manager, beginning with one man and a small kit of tools, developed into one of the largest and probably the most unique of manufacturing plants in the South. Through its own work in Charlotte and its partnership with mills and factories in New England and Ohio the D. A. Tompkins Company was enabled to furnish on a very large scale all machinery and supplies essential to cotton mills, cotton oil mills, fertilizer factories, electric light and power plants, water works, and other power-producing or power-economizing industries. It was the base of supplies for Tompkins' industrial operations throughout the South.

The building up of this company is a monument to his energy, skill, executive ability, foresight, patriotism, and broad humanitarianism. He loved to tell the story of it; and he told it over and over again, not only in speeches, books, and newspaper articles but even in advertisements, which were intended to be lessons for the youth of Charlotte and the South. The story carries to young men everywhere the assurance that success will always crown merit. From hundreds of advertisments in Southern newspapers the following selections are but samples of his endless sermons on thrift, industry, character, hopefulness, intelligence, self-reliance, and efficiency:

STARTING IN BUSINESS

"It is now something like fourteen years since there came to Charlotte a mechanic who was looking for a place to go into business for himself. He had been considered where he came from as a good machinist, and had also had a good training as a draftsman and designer of machinery. He had the promise of an agency for an engine.

"Working as a machinist or draftsman in a large iron works he had been well at home, but in the business world, on ever so small a scale, he was tolerably awkward. There wasn't very much mechanical employment around here in those days, nevertheless this machinist and draftsman hired a room, got an engine sent on just one engine for stock, and struck out for business. Things looked squally for quite awhile afterward. The new business man was ready for anything that would bring enough pay for wages and store rent. He did some surveying on the streets and laid out the grades of most of the pavements in the central part of the city, commencing at the public square. The pay for this work was not very much, but it went a long way toward keeping the pot boiling. After awhile an engine or two was sold, and the scant profit with all the wages for setting up and starting up the engines helped along very considerably. The man was salesman and machinist, both, for all that he did. He had very few tools, and most of the piping about an ordinary engine was put together with a trace chain and a stick for pipe tongs. The smaller pipe was cut by hand and put together with a Stillson wrench. A small set of pipe taps, with one stock, a hammer, and chisel or two, a trace chain and a stout stick were about all the tools available for putting up an ordinary ginning engine and its outfit.

"Once in a while he would do some surveying for private parties, locating a lot; and would earn wages for a day or two. The business wasn't very promising, and it often looked as if the next month or two might wind it up. But each new month brought enough new work of one kind and another to keep things going. After a considerable time and by inappreciable degrees things got better. The jobs came easier and the pay improved. Customers generally liked the results they got, and some of the first ones began to come again. It gradually came so that there was less work hunting for work, and it required more hustle to keep up with the work that came.

"After a year or more a good business man observed that there was more work and opportunity than there was capital to handle it. He offered to take an interest in a quiet way and furnish some capital to handle the business. A trade was made and then it was a partnership for a considerable period.

"Later still a corporation was formed and that's how the business of the Tompkins Company was founded and built up.

"In those early days, if we had ever let up, the business would have ended. As good luck would have it, the mechanic kept in good health. It looks now, and it looked then, too, as if at any time in the first two or three years a spell of sickness would have ended the venture. It was good luck, too, that this proved to be a country of valuable undeveloped resources; and the gradual development of those helped us. Perhaps we were of some value in helping to push on this development. Anyway, we are still here, and are still having some hand in this development, which is still going forward."

WHERE OUR SHOPS ARE LOCATED

"The growth of the United States and the development of her resources is the wonder of the twentieth century. This growth and development began with the coming of the Anglo-Saxon to the New World. The first establishment in America of an Anglo-Saxon colony was at Roanoke Island on the coast of North Carolina. This was in 1585 and the movement was under the direction of Sir Walter Raleigh.

"Before the ships which brought this party over returned to England there was born a baby who was named Virginia Dare. This girl was the first native American of Anglo-Saxon parentage.

"Years afterward a colony was established at Jamestown in Virginia, in which there was John Smith of Pocahontas fame.

"Years afterward the Puritans landed at Plymouth, in Massachusetts.

"When the ships that brought over the Roanoke party went back to England they were detained and it was two years before they returned to America.

When the ships did return, the colony was gone—nobody knew where.

"There is now an area in North Carolina of about ten miles square inhabited by a race of people known as the Croatan Indians. They are not like other Indians. They resent fiercely any attempt to class them as negroes. They have many of the qualities of the Anglo-Saxon. Living within two or three days' march of where the first colony of Anglo-Saxons ever settled, the civilization of the white man has destroyed or driven out all other Indians. This Croatan tribe has not only been skipped in the progress of civilization, but there seems to be as many of them to-day as there were a hundred years ago.

"There is a legend that the Croatans took the part of the white people when they were attacked by unfriendly Indians. Being driven away from the first settlement, the whites and the friendly Croatans retreated together to where the Croatans now live.

"In any event, the first settlement of the Anglo-Saxons on American soil was on the coast of North Carolina. The State has seen many changes since. These changing events have been somewhat as follows: (1) Conquest of the country and its settlement. (2) Development of agriculture and fair commerce and manufactures. (3) Development of slavery and cotton production and neglect of manufactures. (4) Civil War and abolition of slavery. (5) Revival of manufactures and commerce and improvement of farming methods.

"It was here in the Old North State that the first settlement was made looking to the development of an English speaking nation. The South has had her ups and downs in fortune, but [illegible] though her misfortunes made [illegible] in the past [illegible] making good headway, and our machine shops and the business we are doing is one of the small factors in the State's progress."

WE AND OUR GREAT-GRANDSIRES

"Investigation has shown that in the latter part of the eighteenth and in the early part of the nineteenth centuries Carolinians had about as much, or perhpas more, mechanical resource and manufacturing ability than the people of any other part of the United States. In the Piedmont region there were numerous blast furnaces, rolling mills, foundries, hollow-ware works (pots, ovens, skillets, etc.); nail works, rifle factories, woollen mills, and other industrial enterprises.

"Just before, during, and after the Revolutionary, War, the wrought bar iron from Piedmont forges found a market in Boston. The rifles made in the home factories were an important factor in determining the outcome of the American Revolution. These same rifles were also important factors in dealing with the Indian and the bear both at home and on the frontier in Kentucky and Tennessee, where many Carolinians of daring spirit went to seek adventure, and to stand a bulwark for the protection of advancing civilization.

"Whether it was a bear on the Piedmont slopes, an Indian in Kentucky, or an invading British foe, it was of life-and-death importance for the American to have a rifle that would shoot without fail, and shoot straight. Those made by the mechanics of the Piedmont region could be relied on, and they stood in high favor. Other manufactured products made by the mechanics of the Carolinas of the eighteenth century—this most ancient and honorable order of American mechanics—were also first class and stood in high favor with consumers or users. In time came slavery and the downfall of the mechanic in the Piedmont region.

"Then came the Civil War and the downfall of slavery.

"Then came the so-called Reconstruction period with twenty-five years of anarchy and almost hopeless endeavor to save civilization in the Carolinas.

"Then came the restoration of stable and honest government.

"This being attained, people began to look about for profitable employment. The occupation of the fathers—agriculture with slave labor—being gone, they fell, more or less naturally, as a sort of heritage, into the occupations of their grandfathers and great-grandfathers. One tried cotton manufacture, another the machine business, another undertook to make wagons, another carriages and buggies, another furniture, etc., etc.

"The great-grandson found that though these abilities were dormant in his family through the period of slavery, he could develop, with very little practice, the same old twist of the wrist which the great-grandfather had.

"The descendant of the old rifle-maker is just as good a mechanic as the old rifle-maker himself was. The great-grandson of the wagon-maker of 1790 is making just as good wagons in 1902 as the old man made in the second century before.

"More than fifty of these descendants make up the bulk of the organization in our new shops and keep its wheels turning. There is a moderate proportion of good men from other parts of the United States also incorporated in the organization. It makes a strong combination. The Piedmont mechanic of the eighteenth century did superb work. Our organization does just as good work. We study modern requirements and keep up with the twentieth century times.

"The cotton yarn reels, which we make to-day in our ship, are just as much of a success as Daniel Boone's rifle was. Our cottonseed huller is made for a purpose that those old fellows of the eighteenth century never conceived of; but it is of just as high-class design and workmanship for the requirements of these modern times as the mountain and frontier wagons were for the day and generation in which they were built and used. In those old days, they used to mix sizing in a bucket and put it on the warp with a brush. In our shop we build a size kettle in which sizing is so well mixed that it is like an emulsion—saturates the yarn and never falls off.

"They had no steam engines in those old days. That's the reason the rolling mills were all on water-powers, as at Clifton, Henrietta, High Shoals, Cherokee, and other places.

"We wish one of the mechanics of 1775 could see one of the modern Corliss engines operate after we have overhauled it and put it in good order. Or look through our shop and see the electric drive and the heating by exhaust steam. Or see our new foundry, and compare the way we make castings with the way they used to make them."

INDUSTRIAL PROGRESS

"When the founders of the Tompkins Company business first landed in Charlotte there was mighty little doing. The principal merchants occupied much of their time sitting in chairs in front of their stores, sometimes whittling, sometimes playing checkers or backgammon, and sometimes gossiping. These merchants came to their stores early and went away late. Long hours and little work was the rule. The little work was because there wasn't much to do.

"How things have changed since then, not only in Charlotte, but in the whole South. In those old languid days the dogs didn't get up to bark. If they saw or heard anything that they thought ought to be barked at they lay still, and barked lying down. It was probably the same in Greenville.

"Then there were two machine shops in Charlotte, one doing no miscellaneous work but making machines.

"Then there was one cotton mill in Charlotte; now there are twenty. Then the colored people monopolized the business of barbering; now it is well nigh monopolized by white barbers. Then the business man took his hat off to the banker; now the banker doffs to the business man and finds that he likes it; the business man appreciates the courtesy more than the old-fashioned banker did.

"In those days the Tompkins Company's assets was a kit of machinists' tools and the whole organization was a founder and a cheap helper. There were no debts because the banker couldn't see any basis of credit in the kit of tools—there was value all the same, but it wasn't in tangible shape for a banker to realize on.

"Gradually we built up a business and then facilities to do the business. We could get a little more business and then a new tool, more business, another new tool, and so the building has been going on until we now have a large foundry and two large machine shops—all out of that original kit of machinists' tools.

OPPORTUNITY WITHOUT CAPITAL

"Our business has been built up by work and not by money. There wasn't any money to start with.

"The reason is that the fellow who can do things is the master and not the servant of capital. Capital seeks the man who can do things a heap more than he ever has to seek capital.

"We are not only getting a good home trade and a growing one, but our territory is extending nicely above the Potomac.

"Something like 100 years ago North Carolina made wrought iron, much of which found a market in New England.

"We are helping to bring about the old condition. We have had several orders from New England for the products of our shops and we have a good trade in the Middle States."

WAGES VS. SALARIES

"The cry of the industrial world is for men who can actually do something. We have applicants every day by young men and old men who want 'positions.'

"'What can you do?' is the first question we ask, because we really need men. We need right now four good machinists and two molders. These don't come along. If most of those who do come would answer our question in full frankness they would say, 'I can't do anything in particular with any degree of efficiency, except draw my "salary" and quit promptly when the whistle blows.'

"It seems a pity we haven't a better system of training the boys and young men in a way to make them capable of actually doing something. A machinist apprenticeship can't hurt any boy, even though he expects to be a lawyer or a doctor.

"There's plenty of time between school and college terms to give a boy or young man a practical apprenticeship. This time is usually worse than wasted. The boy not only fails to learn to do some useful thing, but does acquire idle habits, sometimes vicious habits.

"Our view of the matter is that none of the schooling would be omitted, but that a reasonable portion of the intervening time should be applied to learning some trade. It's as easy to teach a boy to love work with the result of capability as it is to let him drift into habits of idleness with the result of incapability."

EARLY TRAINING

"The surest way to get a high position is to fill a modest one well. The restless and impatient man who neglects his work in quest of advancement is never advanced. The languid fellow whose mind wanders from his work to reveries of wealth and fame, he's no good. Yet speak of a good position at good pay, and there are at once applications from these restless, impatient, and languid fellows, while the sterling worker works on, and must be sought out and approached.

"Training in early youth has a lot to do with it. A realization that all things come to him who works and waits has a lot more to do with it.

"If the deficiencies were due to inherent fault in our people, there would be no use to speculate upon betterment. But there is no inherent fault. The youth should be trained and made to learn to work, developing at the same time skill and physical strength, and the young man should be taught that education entitles a man to nothing if he fails to accomplish something.

"There are few people who may not be successful if in youth they have the right training and in young manhood they learn to have a wholesome reliance in patient and honest work."

THE VALUE OF A TRADE

"The financier values a property according to the income it will bring in and the probability of this income being permanent.

"On a basis of 6 per cent., a property that would bring in $75 a month would be worth $15,000.

"There are many mechanics making $75 a month. Many make more. Some good machinists make $4 a day easily and regularly and not a few make $5. A locomotive engineer can make $125 to $175 a month.

"These are wages of journeymen workmen and not bosses or superintendents. The figures represent the value of a trade. Capitalize these incomes on a basis of 6 per cent., and we find the value of skill in good workmen to be about as follows:

Bricklayer, at $2 per day	$10,000.00
Carpenter, at $2.25 per day	11,250.00
Molder, at $2.50 per day	12,000.00
Pattern makers, at $2.75 per day	13,750.00
Machinist, at $3 per day	15,000.00
Machinist, at $4 per day	20,000.00
Machinist, at $5 per day	25,000.00
Locomotive engineers at $6 per day	30,000.00

"These figures represent nice sums of money. As long as the mechanic lives and enjoys health these little fortunes are more secure than if they were in cash and invested in property.

"This capitalized value of a trade cannot be risked in a cotton speculation. Nothing but sickness or death depreciates these values.

"If a man has the faculty of governing or directing men, he is far more apt to get the opportunity to exercise this faculty and get pay for it, if he knows a trade well, than if he does not. In selecting a superintendent for a cottonseed oil mill, the man who is a good mechanic is always selected by preference, if other things are approximately equal.

"In civil life the mechanic is as independent as the soldier in military life. The five-dollar-a-day mechanic is just as securely fixed for life, as to a living, as the one-hundred-and-twenty-five-dollar-a-month captain in the army. The captain may become a general. The machinist may remain machinist all his life, yet he may become proprietor of a factory. The special training stands not in the way of success, but promotes it."

OUR APPRENTICES

"We make apprenticeship contracts, the D. A. Tompkins Co. being first party and the boy and his parents being second party. The apprenticeship term is three years, the first six months is a trial period for both parties to the contract. We pay 60 cents a day the first year, 75 cents the second year, and $1 the third and last year.

"We don't require these young gentlemen to put in three years' continuous work. We rather prefer that they should not do so. We always give them leave of absence to attend school. After school term they come back and start where they left off. This makes us always crowded with boys in the summer. At present we are overrun because all the schools are out and all the apprentices want to work on their apprenticeship time at once.

"We don't let the boys off for anything but a short vacation and for school. The system seems to be working well and those who have gone through this apprenticeship, and at the same time kept their education going, have come out in the end first-class journeymen workmen and decently educated young gentlemen who can do things.

"The trades in our shops are: (1) Machinists. (2) Pattern Makers. (3) Molders. (4) Draftsmen. (5) Electric Wiremen, and (6) Roll Coverers.

"The combination of practical training and teaching makes the best man. It makes a man who knows how things ought to be done and who can do them."

When working in the Bethlehem Iron Works Tompkins had written in his diary, "Someday I shall have a machine shop of my own, even if I make a start as a blacksmith at a country cross roads." His resolution was accomplished. D. A. Tompkins, engineer and machinist, has become the D. A. Tompkins Company, with large, well-equipped machine shops and foundry, builders and distributors of machinery for cotton industries, consulting and contracting engineers for the designing, constructing, and equipping of cotton mills, cottonseed oil mills, fertilizer factories, and other industrial plants.

The building up of the D. A. Tompkins Company was in a measure the building up of cotton mills and cotton oil mills throughout the South. But it greatest value to the South was its demonstration

1. That the South had native talent equal to it task of industrial development.

2. That this talent could easily be trained and utilized.

3. That capital was available from abroad and easily multiplied at home.

4. That a capable lad can begin at the bottom of the industrial ladder and climb to the top.

CHAPTER X

A PLAN TO RAISE CAPITAL FOR MANUFACTURING COÖPERATIVE MILL BUILDING

AFTER much experience in constructing and operating cotton mills and cotton oil mills Tompkins came to the belief that the mill business furnished an opportunity for coöperative investment by small communities or by men of small means in large communities. On reaching this conclusion he was not slow in putting it to the test. With characteristic energy he entered upon a campaign for coöperative mill building, flooding the press with literature, filling the mails with circulars, and canvassing personally wherever opportunity presented. Facts and arguments for coöperative mill building were spread broadcast throughout the South. He made stirring appeals to local pride and local interest, showing the disadvantages to a community of relying upon foreign capital in mill building and submitting to foreign control in mill management. He showed how any community by a little thrift, energy, and coöperation could build a cotton mill.

"In most places," said he, "where a new mill is proposed, an idea is prevalent that if half the money is raised at home, then somebody from somewhere will furnish the other half.

"Several years ago the builders of cotton mill machinery took stock in new mills as part payment for the machinery. This brought on numerous complications and trouble; and the practice has now been entirely abandoned.

"Commission houses in the North who sell cotton mill products have often taken stock in new Southern mills. They do this of course mostly for the sake of controlling the sale of the mill's products. For while Southern mill stocks are always splendid property, there must always be some extra inducement for capital to seek investment in distant localities. A mill having a large part of its stock owned in this way is restricted in the sale of its products to one special market, which market might at some time not be the best for that particular kind of product.

"All foreign capital is attracted to new enterprises at a distance by some distinct motive, and is governed by well-defined laws. Large amounts of Northern money have been invested in Southern cotton mills, but they have been influenced by the motive above mentioned, or have been invested in stocks of mills already successful, or with men well known as successful manufacturers. The distant capitalist is attracted by success already accomplished, and is not disposed to risk money to prove whether a new locality and a new people are both adapted to make a success of cotton manufacture. Success in a new mill or town, once established, often brings foreign capital without the asking.

"The home capitalist is influenced largely by the same motive as the foreigner. He prefers for someone else to make the experiment in manufacturing; if it is a failure, then he has escaped; if it is a success, then he can go in and buy the stock or start a new similar enterprise.

"The average Southern town underestimates its ability to raise capital to build a cotton factory. Cotton mill property, like all other property, is cumulative. No town could raise the money at once to pay for all the property in it."

After building several coöperative mills Tompkins drew up and published in pamphlet form his plan to raise capital. The pamphlet was extensively circulated throughout the South, was very generally copied in the newspapers, and published in various journals. It covers the ground of coöperative cotton mills, and is easily adaptable to any kind of coöperative industrial enterprise.

PREFACE TO PLAN

"While working as a machinist, and in other capacities for the Bethlehem Iron Works, Bethlehem, Pa., I always carried some stock in one or more of the local Building and Loan Associations at Bethlehem.

"Toward the latter part of my service with that company I devised plans for the organization of a Savings Fund and Building Association. The plan was that nine of my fellow workmen with myself should form an association for saving something out of our salaries and wages each month, and, putting these savings together, should use the fund—not to loan, but to build houses for rent and for holding as investment.

"At $20.00 per month each the ten of us would pay into the Association $200 per month. With this we could soon have built a house, and then with the continued payments and the rent from the first house we could soon have built another, and so on. We thought of continuing this process and also the use of rents for building for a period of ten years. Then we proposed to stop payments and use rents for dividends.

"Two of my fellow workmen and I purchased something like thirty lots, having in view turning them over to this Association.

"Just before the time for organization of this little Savings Fund and Investment Association I moved away from Bethlehem and the plans were never executed. The thirty lots are yet undeveloped in Bethlehem, and are still the property of the two of us who survive and the estate of our third partner who has passed away.

"After going into business in Charlotte, N. C., on my own account, I worked out a modification of the same plan for raising capital to build manufacturing plants, and published it in the *Manufacturers' Record* of Baltimore and other periodicals.

"This plan of raising or accumulating capital has been utilized for building 15 or 20 cotton mills in the South, principally in the Carolinas.

"This pamphlet gives a synopsis of the general plan, as applied to building cotton mills. The illustrations exhibit some of the mills which have been built by the use of the plan.

PLAN TO RAISE CAPITAL FOR MANUFACTURING

"There are in successful operation in the southeast a number of cotton factories built by money raised on the installment plan as the payments are made in a building and loan association. The writer had observed that in many towns there was a strong desire amongst the people to build and operate a cotton factory, but conceived it impossible to raise the capital at home because, as a rule, few people in towns or small cities have much unemployed capital. It was further observed that in almost if not quite every one of these instances one or more building and loan associations were in operation with accumulated cash in excess of what was considered impossible to raise for the construction of a cotton factory. The conclusion was therefore reached that if a plan could be formulated by which a company could be organized whose capital stock was made payable in the shape of regular weekly or monthly saving, then any ordinary community could raise the money to build a factory.

"Following out this line of thought it was found that with shares of one hundred dollars par value they could be paid in full as follows:

(1) At the rate of one dollar per week per share the par value would be reached in a little less than two years. (2) At the rate of fifty cents per week the time would be a little less than four years. (3) At the rate of twenty-five cents per week the time would be a little less than eight years. All of these plans of payments have been tried at Charlotte, N. C., and in every case the result has been successful.

"The plan (2) of fifty cents per week per share, it seems, is the most popular and the most suitable for all ordinary cases and places. At this rate the following would be the regular payments for about four years:

On 1 share ($100), 50 cents per week or about $2.00 per month.

On 5 shares ($500), $2.50 per week or about $10.00 per month.

On 10 shares ($1,000), $5.00 per week or about $20.00 per month.

On 25 shares ($2,500), $12.50 per week or about $50.00 per month.

On 50 shares ($5,000), $25.00 per week or about $100.00 per month.

"In organizing a company each subscriber for stock makes the payments as above indicated either by the week or month.

"On the basis of subscriptions aggregating one hundred thousand dollars there would be paid the company each year about twenty-five thousand dollars. With this amount of money the buildings could be constructed and paid for in the first year. Within the second year one third the machinery could be purchased and put in operation. In three years from the time of organization it would be usually possible to have the entire plant in operation with some debt, which could be paid off as the installments were paid in the last year.

"A capital of one hundred thousand dollars will build a mill of about five thousand spindles and two hundred looms which would furnish work for about one hundred hands. These estimates are only given for the purpose of conveying the most general idea. There are infinite conditions that might vary any one of the items given, and therefore in each special case the general result might be different according to the cost of materials and the kind of product desired to be made.

"The illustrations and general data are taken from mills that have been built on the plan herein discussed.

"It goes without saying that the quickest time in which the capital can be accumulated is the best. If subscriptions can be procured on a basis of two dollars a week per share, thus making the capital payable in about one year, this would be the next best thing to having the money subscribed subject to call as it might be needed. Next to the rate of two dollars per week then one dollar per week would be desirable.

Then follows fifty cents a week and twenty-five cents per week.

"The last-named rate, while it has been proven practicable in the case of a few mills, is undesirable, if the subscriptions can possibly be got to fifty cents per week or more.

"The plan of fifty cents per week has been the most popular one, and it has in all cases worked well, the result having been dividend-paying manufacturing plants.

"The completion of a mill may always be hastened beyond what could be done with ordinary income by borrowing money to complete the mill at once and then paying this money back as it is paid into the treasury in installments by the stockholders. Where-ever this has been done the mill company has commonly made notes which have been made secure by indorsement of the directors. For this reason it is desirable to have a board of directors whose responsibility is well known.

"Some mills have been built, however, simply by investing the money as it came from the members; and while this is somewhat slow, yet when the mill is finished and in operation, it is usually so much property ahead for the stockholders, for it frequently represents money that would not have been accumulated at all, except for the obligation of the stockholders to get together and save so much money each week or month.

"By the means of this plan any ordinary town has within itself the resources to establish a cotton factory. And besides establishing a factory the company is practically a savings institution for the people. Regular and systematic saving is probably the best of all means to accumulate money and at the same time encourage a spirit of thrift and coöperation amongst the people of any locality. Any good farmer could take one thousand dollars stock, paying two hundred and fifty out of each crop for four years.

"A mill built on this plan, when once finished, is just as good property for the stockholders and does a town or city just as much good as if it had been built with money brought from elsewhere. In fact, it is more advantageous, as its construction develops a latent resource out of which further development is sure to come.

"The preliminary preparation for the organization of such a company in the way of preparing the right kind of character, by laws and subscription list, should be left to the engineer selected to make plans and guide the company in the conduct of its affairs.

"It is very important for a company of inexperienced people to select a good engineer and then rely upon his knowledge, skill, and judgment. Any attempt to build a mill without good counsel will be troublesome. Advice picked up here and there, free of charge, is worth just what it costs, viz., nothing. A good engineer will charge a good fair price, and will handle the matter just as a good lawyer would a lawsuit, or as a physician would handle a case of sickness. There are numbers of good engineers in the country whose records for successful work become a guarantee for the success of whatever they undertake.

"By the plan herein explained those towns in which the people are waiting for some capitalist to come and to build a mill may help themselves and build a mill without outside help. Capital naturally seeks investment amongst people who have themselves exhibited resource and capability. When a cotton mill has been built on this plan, the result is not only a manufacturing plant for the town, but a savings institution has been worked out in the manner of raising the money with which to build the mill. Every one of the towns and cities of the southeast that are now well known as manufacturing places built their first factory out of native resources and without outside help. As a result, whenever New England money is looking for investment, it is likely to go to one of these places where success has already been demonstrated.

"In one or two cases another feature has been introduced, viz., subscribers give notes for the amount of their subscriptions. By this plan the company has the notes to use for collateral in case of borrowing money; and if the notes are made interest-bearing, then the burden of interest falls on the subscribers and not on the treasury of the company.

"As soon as the mill is in operation the matter of interest balances, provided the profit equals or exceeds the interest account. If the stockholders pay the interest, then the mill ought to pay a dividend from the time it starts up. But if the mill carries any interest account, on account of any unpaid subscriptions, then the stockholders ought not to expect any dividend until the stock is paid in full.

"The factories built with capital raised on the above plan have all been successful, and are now doing well."

CHAPTER XI

PROMOTER OF INDUSTRIAL AND TECHNICA EDUCATION—TRUSTEE OF NORTH CAROLINA COLLEGE OF AGRICULTURE AND MECHANIC ARTS—ADDRESS ON TECHNICAL EDUCATION

THE development of the New South was muc
hindered by lack of skilled labor and tec
nical knowledge. The supply of orators a
statesmen exceeded that of mechanics and enginee
Tompkins was deeply impressed by this conditio
His education at the Rensselaer Polytechnic Ins
tute, his apprenticeship in the Bethlehem Iron Work
his construction and management of cotton mill
cotton oil mills, fertilizer works, and electric pow
and light plants, his manufacture of machinery, h
inability to procure workmen for these enterprise
his business connection with Northern manufacture
of machinery, his frequent trips North with observ
tion and study of Northern progress in wealth, popul
tion, education, and industries, all confirmed a
strengthened his conviction that the industrial sup
riority of the North was due to technical skill a
knowledge rather than to superior natural resourc
or superior natural ability. The difference betwe
the two sections he credited to their systems of educ
tion and labor; on the one hand, a system of intell
gent, educated, free labor—on the other, of ignoran
untrained, and irresponsible slaves. Now that sla

ery was gone, ignorance must go with it. The New South must be founded on education.

In the midst of labors and activities that would overtax an ordinary man he took up the task of arousing the South to an appreciation of the value of education in developing wealth and power. He threw his energy and talents into a campaign of education which he kept up for twenty years in public speeches, in addresses before schools, colleges, and universities, in newspaper and magazine articles, in appeals to manufacturers, in the establishment and operation of mill schools, in urging and assisting young men to avail themselves of the best educational training and culture.

"The South must move in the matter of education," said he, "and keep moving, else in time the people who are keeping up and ahead in education will own the rest of the country. As 'eternal vigilance is the price of liberty,' so persistent energy in keeping pace with progress is the price of being amongst the successful peoples of modern times. Ohio is not furnishing our Presidents by accident. It is not by accident that I go from Charlotte to the North to buy water wheels, gas engines, etc. It is because of systems of education that qualify the people to be the most competent to do these things. The South should follow this lead, and never rest till our people lead the world in education. If we do this, we will then take a leading part in supplying the world with manufactured products. The natural resources of the South are unsurpassed. We need knowledge and skill to handle them to our own advantage, and we ought to qualify the youth of the South to handle them for our own people and not wait supinely for strangers to come and take possession of them, thus leaving the wages paid by the stranger to be the only advantage to our own people."

In a striking letter from Dayton, Ohio, published in the Charlotte *Observer* and copied extensively by the Southern press, he elaborates this idea as follows: "The central Northwest is an area great in population, wealth, and intelligence. Chicago on the Lakes and Cincinnati on the Ohio are great cities, but there are many others that would be boasted great in population and commerce if they were in other parts of the nation.

"What is it that makes the wealth and influence of this central Northwest?

"The great and controlling factor in making the people of the central Northwest rich and powerful is education. The public schools here in Dayton are of unbounded interest. These are some of the figures in round numbers:

Population of Dayton	85,000
Cost of high school building . .	$330,000
Number of district schools . .	19
Number of school teachers . .	350
Salaries of teachers, each	$400 to $1,500
Aggregate salaries	$200,000
Students in high school . . .	1,050
Pupils in district schools . . .	14,000

"How can the cost of such expensive systems be borne?

"Some of the graduates of these schools are the mechanics who make water wheels which are sent to North Carolina; and some of the money comes from these. Others make oil mill machinery, which goes to North Carolina; and more of the money comes from there. Others make Corliss engines, which go to North Carolina; and still more of the money comes from there. And so on with many other articles requiring knowledge and skill to make.

"But we get some of this money back; for I saw in a large dry goods jobbing house a pile of goods with 'Highland Park Manufacturing Company' on the bands. Quite a lot were from the Cone Export Company, of Greensboro, and there were white goods from Piedmont, Anderson, and Greenwood, S. C.

"In the exchange of products between Dayton and Charlotte the former has the advantage. We used to exchange our raw cotton for whatever we needed. Latterly we are doing better, and we now exchange cotton goods that are plain enough to be made by labor that has little or no education and scant skill, for gas engines, photo-engravings, etchings, water wheels of high efficiency, and other products carrying better profits and made by higher class and better paid workmen. But Charlotte is going forward, perhaps, at a better pace than Dayton is now going. Whether we gain or lose in the race is to my mind a question of education."

He was in constant demand as a speaker on educational topics; for his power of thought, his clearness of expression, his forceful illustrations, and his wide knowledge made him entertaining, instructive, and inspiring. Literary clubs and lyceums, school and college commencements, alumni associations, boards of trade, state legislatures, conventions of the various professions, associations of manufacturers, bankers, and farmers kept him busy. He responded to invitations as often as he could get away from business engagements. He spoke before the leading colleges and universities of the South and a large number of high schools and academies. Such audiences were especially pleasing, because he saw in them potential centres of wide influence.

One of his addresses, delivered before college men in North Carolina, reviewed the educational and industrial history of the State, emphasized the commercial value of education, and demanded better equipment for the State institutions.

"In all the world," said he, "education is one of the cheapest things to buy and one of the highest priced things to sell. States and nations spend money in various ways and in large sums to promote commerce, or to improve agriculture. No fostering appropriations contribute so much toward any of these as the same amount of money would contribute to them all if expended in education."

. . . .

"Some countries have exports that are small in tonnage but large in money values. These large values in money on very small tonnage show the prices obtained for education. Our people sell cotton at six cents, send it to Germany where it is manufactured into socks, and we buy it back at $1.00 a pound. We send our finest upland long staple cotton to France at fifteen cents a pound, where it is made into fine organdies and we buy it back at $40 a pound. We send our Sea Island cotton at twenty-five cents a pound to Switzerland, where it is made into Swiss embroidery; and we buy it back at $80 a pound. When our people buy these goods they pay mostly for education."

. . . .

"The wealth of the State lies in her undeveloped resources. The poverty of the State lies in the want of education and training of the people for the profitable development of these resources. Strangers are coming from other states that are more liberal to their people in matters of education, to take advantage of our rich resources. In letting this come to pass, is the State fair to her own home people? Shall the best resources, the best salaries and compensations go to strangers because our home legislators refuse the necessary facilities to home people to be as fairly taught and as fairly trained as those strangers?

. . . .

"For the interests of our people it is imperative that we bring our State University to be the full equal of Harvard, Yale, the University of Michigan, or the University of Wisconsin, and our State Agricultural and Mechanical College to be the equal of the Rensselaer Polytechnic Institute, the Columbia School of Mines, or the Massachusetts Institute of Technology. The cost of an education to-day at either of our State institutions is probably about two to five hundred dollars a year. The education received at this low cost may easily be made by application and integrity to bring a salary, or other increase, of 1,200, 2,500, 5,000, 10,000, and even 25,000 dollars a year. Resources and opportunities are here in this State in abundance; education alone is necessary to bring out the values of them."

His interest in public schools was no less marked. He advocated popular education as an essential basis of industrial progress. He demanded an increase of taxes for public schools, although a large tax payer himself and a large contributor privately to both public and private schools. He demanded bet schools and longer school terms, even if the St should be compelled to issue bonds. The follow editorial, written by him and published in the Ch lotte *Observer*, of which he was controlling owr sounds a trumpet call to the Legislature:

"PLANT THE FLAG OF EDUCATION"

"This State has vast resources which have l dormant through the centuries past, and the devel ment of which has just begun in the last few yea Whatever advance education has made in the St has been perhaps the most valuable factor in cond ing to the beginning of the development of the sources of the State. Every educational institut has contributed to the end of qualifying the you of the State to know the resources that are here, a to stay at home to help develop them, wher formerly the youth of the State had to go to so other distant section to find occupation and prof

"Whatever else the legislature does or does not it ought to plant the flag of education through State. Instead of hesitating too much about cost, we should make certain of at least six mont school, and take chances on raising the money. is really a case where we cannot afford to do less th establish a six months' school term throughout State. The education will show the way for rais the money. We are not here regarding educat as so much of a burden upon the resources of State, but rather as means of bringing the Stat resources to profitable fruition. Better educat will not only conduce to more tax money, but conduce also to better observance of the rules the Christian religion, to better morals, to better thrift and economy, to better industry, to the betterment of the children and youth of the State, and to the general prosperity of the State in all future time. We earnestly recommend to the legislature that it make sure, first, of an increase of the school term, and then raise the money the best we can, if we go in debt a little more. The schools and the education of the youth of the country will pull us through in the matter of the debt; but if we let things drift into the alternative of ignorance, ignorance will never improve the State in any particular."

An editorial, directed at the manufacturing towns of North Carolina, sets forth his ideas of elementary industrial education, as follows:

"TRADE SCHOOLS"

"This State has developed a large number of manufacturing centres. In different centres the manufacturing is different. Durham and Winston manufacture tobacco; High Point, furniture; Charlotte, Rockingham, and other centres manufacture cotton. There is great need of trade schools as they exist in Germany and as they have been developed to a very considerable extent in other continental countries and in England. Such schools should be adapted to the particular manufactures prevalent in a community. If it requires a knowledge of the game and practice to develop skill to play baseball, we know that it requires more knowledge and skill to qualify a man to spin yarn, make furniture, and manufacture tobacco or trousers. These all require as high a degree of special knowledge and special skill as playing football or playing baseball. We all know what sort of a figure a man would cut going on a baseball or football field wholly unskilled, to undertake to play with the modern players. In view of the different kinds of education the formulation of the plans should be left to local centres of manufacturing districts. This would seem necessary fully to adapt the school to the local needs. Teaching ought, to a large degree, to be done not in courses of study but to the extent and of the kind that the applicant wants. Learning should be dispensed by the quart and the gallon as well as by the barrel. Here in Charlotte some movement looking toward a trade school has been accomplished by the Christian Association people both in their main building in the city and in the Southern Industrial Institute at Hopkins. Some work has also been done at other points in the way of small beginnings.

"One or more well-developed trade schools in a centre like Charlotte should have the recognition of the State and of the public school authorities. The future development of manufactures is very dependent upon special education and training. In Massachusetts a great deal of attention has been given to this subject, and in time our educational authorities will have to take it up and do something."

An editorial, intended to influence sentiment in his native town of Edgefield, S. C., set forth his ideas of education for a community partly agricultural and partly manufacturing:

"A PROPOSED SYSTEM FOR EDGEFIELD"

"The system should begin with the kindergarten. It should then go through the 7th or 9th grades of literary and scholastic education, with such contact with practical features as are available. It should have a small farm; and farm work should be demonstrated to the scholars. Then it should continue through the high school, and there should be classes in the special activities in practical work in the neighborhood. In the grades the pupils should be thoroughly grounded in the three 'Rs.' In the high school they should have the equivalent of a practical apprenticeship in some trade, and they should study special technicalities that apply to the various vocations of the neighborhood. This in Edgefield should include the manufacture of cotton oil and other products of cottonseed, the manufacture of yarn and cloth from cotton. It should also especially include instruction in farming, both from books and from practical demonstration; and there should be a good course for domestic science for the young woman. This high school can ultimately be brought to be the equivalent of a college, and can be made to yield values out of the resources in and around Edgefield through its educated graduates. The school should be a free school, and should ultimately be the central school for the county, at the same time be a tributary school to the A. & M. and Winthrop, the Citadel and the University."

In 1893 Tompkins was appointed by the governor and confirmed by the State Senate, a member of the Board of Trustees of the North Carolina College of Agriculture and Mechanic Arts, which had been recently established under the provisions of the Morrill Act of the Congress of the United States "to provide Colleges for the Benefit of Agriculture, Mechanic Arts, and Military Tactics." From this date until his death, with an interval of two years, he was a member of the governing board of the college, and was the most potential factor on the board in molding the character and developing the work of the institution along lines in harmony with its mission. At the time of his appointment the college was in its fourth year, struggling for existence, with a small faculty, with scant equipment and very inadequate support either from patronage or from legislative appropriation. The State was suffering from poverty; agriculture was its chief resource, and agricultural products were at a low price. The people were pinched in living and were not disposed to support, either by patronage or by taxation, institutions for higher education. The university was very grudgingly given a mere pittance; and even this pittance was used as a firebrand by demagogues and bigots to inflame popular passion and prejudice. There was little appreciation of the value of higher education; and very few people comprehended even vaguely the purpose, character, or value of technical education and industrial training.

Until the appointment of Tompkins, the Board of Trustees of the college, although consisting of honest men devoted to the interests of the college, had not included a single member who had received a thorough technical education. This great desideratum was now supplied by a man whose talents, education, experience, ambition, and public spirit made him a blessing to the institution and the State. His missionary work in the South as speaker, writer, lecturer, on technical and industrial education; his practical work as organizer, builder, and manager of industrial enterprises; his long and powerful advocacy of popular education; his skill and knowledge and experience as a civil engineer were all now to culminate in the work of organizing and building up and directing a great people's college for technical and industrial education. His service on the Board of Trustees extended through nineteen years, during which period the writer, as president of the college, was closely associated with him for nine years in the college management. His advice and assistance were always helpful and freely given. He was not only level-headed and practical but well-trained and experienced in all lines of college work, especially in civil, mechanical, and electrical engineering and textile work. In agriculture he was well-informed, experienced, broad-minded, progressive, and scientific. He would visit every department of the college, inspect its work, and suggest something helpful. But he was not meddlesome nor officious. He had neither interest nor part in the little wrangles and petty discussions over small details of college life which so often engage the attention and deeply interest the minds of college trustees lacking in business experience and enjoying narrow views of life. He understood the necessity of leaving all details of management to the college officials.

The development of the college was his aim; and he sought to achieve it by all possible agencies: by competent teachers with adequate salaries; by ample equipment in shops and laboratories; by lofty ideals and high standards of efficiency; by healthful, handsome, modern buildings; by wholesome, generous diet. His aim was the evolution of a technical college in keeping with the spirit of the age and worthy of a commonwealth of two million people.

To the president of the college Tompkins was a comfort and a help in many perplexing and discouraging problems. His vision of future developments, coupled with tolerant acceptance of unavoidable temporary deficiencies, rendered him a most helpful adviser. The most depressing condition in the early college days was the low grade of instruction and the low standards of attainment. In discussing this condition Tompkins would always accept it as a temporary necessity. "It will soon give place to something better," he would say. Of an indifferent teacher he would say, "He is a cheap man, and we can expect little from him. We shall do better in time." Of trifling and frequently vicious pupils he would say: "The college is new, and the whole idea of industrial education is new to our people, who were wedded to the old traditions of education. The college cannot attract the best material all at once, but in due time it will come." Of a building faulty in construction, or a department poorly equipped, he would say: "It is poor, indeed, but better than nothing. It will do for a beginning." In education, as in business, he was for doing the best possible with the material available.

His mental attitude was always helpful. While tolerant of present imperfections, he understood thoroughly what was essential to improvement and future development. Others, to whom were entrusted the destinies of the college, whether members of the Board of Trustees or members of the State Legislature, were firmly and proudly fixed in the belief that the meagre and antiquated plant of the college was superior to anything in the old world or the new. Tompkins knew better, for he had seen the best equipment and experienced the best training and enjoyed a large experience. His was an intelligent estimate of technical and industrial education. And yet he was prompt to make the most of whatever was available. He would start with a ten-thousand-dollar equipment, knowing that it would soon become a million-dollar plant. "I will make a beginning of a career in iron if I have to start as a blacksmith at a country crossroads." This had been the animating principle of his early life, and he applied it to the early life of a technical college.

Tompkins was a great favorite with the college students, who loved to hear him speak, and manifested by attention and applause their keen appreciation of his best thoughts. He never talked down to a college audience, but presented them with his loftiest ideals and his deepest thoughts. He delivered before the faculty and students an address worthy to be printed on the walls of every Southern college. It manifests in a high degree his fine talents as thinker and speaker, his sympathy with young men and ability to inspire them, his love of the South, his appreciation of the value and power of skill and knowledge, his love of mankind and broad views of life.

The address was as follows:

TECHNICAL EDUCATION

AN ADDRESS DELIVERED TO THE STUDENTS OF THE NORTH CAROLINA AGRICULTURAL AND MECHANICAL COLLEGE AT WEST RALEIGH, DECEMBER 15, 1899

"I have come from my work and appear before you in my working clothes. If I had done this ten years ago I would have appeared in a suit of overalls, with a hammer in one hand and a coal chisel in the other. I regard it to be far the most important feature of my education as an engineer that I served an apprenticeship at the machinist's trade, and had a long term of experience as a journeyman machinist. I also had a service as draftsman, and then as master mechanic. It was ten years after I graduated from the Rensselaer Polytechnic Institute, of Troy, N. Y., as an engineer, before I assumed to undertake any comprehensive engineering work on my own responsibility. This ten years was a period of practice and arduous training.

"As the burden of what I shall say to you to-night will be to emphasize the importance of training and skill, as well as of study and knowledge, I hope that the scant reference I have made to my own work may be taken as simply to show, at the outset, that I have conscientiously practised what I shall recommend and urge upon you as being necessary for the best interests of Southern progress and for your future welfare and success in life.

"Enough has been said and written about the value of technical education to create great expectations on the part of those who have been its promoters and patrons. In some instances there has been disappointment. Sometimes mothers and sisters have kept boarders and washed dishes to keep a bright son and brother in school, with the fond expectation that when he graduated he would get a position at a good salary, set up a house for them to keep, and with nothing else to do. It has sometimes happened that the young graduate has returned home with a fine education, only to add an unprofitable member to the household. His mother and sisters could observe that he had learned much, that his conduct was gentlemanly and honorable, that he industriously sought employment, that he was perfectly willing to work, yet he found nothing to do. Under these circumstances there is naturally disappointment. For the time being it would naturally seem to them that technical education had not all the advantages claimed for it. The trouble in such cases is that the young man has been amply equipped in the matter of teaching, but he was deficient in training or skill. He knew the theories, but he served no apprenticeship.

"There have been absolutely no cases, where knowledge and skill have been combined, where easy success has not followed.

ENGINEERING AND MUSIC

"Engineering is a science and an art. For the science careful study is necessary. For the art arduous practice is necessary. It may be compared to music, which is also a science and art. Let us suppose it had been the sister who was to have been educated, and music was to have been her career. If she had gone to a conservatory and studied to the utmost limit all the science of music, but had never practiced it, what could she have done in giving a concert? If she had come home thoroughly equipped in the science of music, but without practice, she, too, would have been compelled to become one more of the household to be supported.

"There was a time when, for an ordinary community, the musical requirements were simple. Whoever could turn a tune on a violin, or thump a tune on a piano by ear, was a musician. So, also, there was a time when the man having practice but no education—the self-made man of the former generation—was the great boast of his day. With the more exacting conditions of these modern times, with the advancing of civilization, we hear nothing about the self-made man, about the man whose college was a canal boat.

"These were men, however, of sterling worth. While they had scant knowledge, they had amazing skill; and they performed wonders in handling humanity and in accomplishing material results to their country's advantage. Some of them, realizing their own deficiencies in education, and realizing what a tremendous advantage additional education would have brought to them, founded schools; but, remarkable to relate, they caused to be formulated, in most cases, courses of instruction in what they were themselves deficient in and omitted all care as to the reliable training that they possessed. They founded universities without systems of training or practice.

"Perhaps the best educated people who ever lived in the United States were the Southern planters' sons before the Civil War, if their future occupation is taken into consideration. These, in their youth, all had a full apprenticeship in the work of planting cotton and tobacco. Whether required to do it or not, they rode mules, drove wagons, and did all the operations on a plantation. The young man growing up on a plantation not only knew about mules in general, but he knew the characteristics of each mule on the place. He knew every negro on the place. He knew every ordeal of the plantation life, and at an early age knew these details better than his father did. Add to this perfect apprenticeship a college education, and you have the education of the men who in the ante-bellum days governed the nation. They were successful in the government of the nation because for the then existing conditions they had been well educated and trained.

VALUE OF TECHNICAL EDUCATION

"In material value a well-rounded technical education, made up of equal parts of knowledge and skill, is difficult to estimate. The Rensselaer Polytechnic Institute was founded in 1820, and the graduates were the chief factors in the development of the American railway system, in contra-distinction to the English system, which latter was followed and copied throughout Europe. These graduates almost invariably started in railway service as rodmen and chainmen. And they do yet, at pay something like $30 a month. They then find places as section bosses, then as division superintendents, and finally as presidents, as was the case with the late Mr. George B. Roberts, who was the president of the Pennsylvania Railroad, and Mr. A. J. Cassatt, who is now president. We have far the finest and most practical system of railways in the world; and the distinction of the system is its originality. The American bridge system is also the outcome of that school. The Reeveses of the Phoenix Bridge Works and the Roeblings, who built the great Brooklyn Bridge, are all graduates from Rensselaer.

"In metallurgy we always needed high protective duties, until the Columbia College, New York, sent out some graduates who were well equipped in metallurgical knowledge and in skill. I regard that the rapid progress we have lately made in the production of cheap and excellent iron and steel on an expert basis is due more to the work done by the graduates of that school than to any other cause. There are now a number of schools in both engineering and metallurgy that are turning out graduates that are as well educated as those who come out of the schools referred to; but those referred to led the way in their respective subjects. The magnitude of the developments in each of these divisions of industrial progress have been simply stupendous.

We have more and better railroads than all rest of the world put together; and after a long hard fight of England to keep her system as the dard one for foreign countries, and very little or part to introduce ours, it has come to pass that is credited as being much the best and is now readily introduced in many foreign countries, ably in Russia.

"In pig iron and steel we have also brought processes and methods to such perfection tha make the best and cheapest product in the w and our expert trade in these is growing to enorn proportions.

"Unhappily, we have no such schools in ap chemistry, in what might be called chemical engi ing, nor in textile engineering. These are practically as large as others, and from a scien point of view are practically untouched in Ame Chemical engineering might bring wonderful re out of our cotton oil and other raw products. many has given much attention to the developn of applied chemistry; and as a result she has mag cent chemical works in which even coal tar and valuable products are obtained, such as an dyes, medicines like phenacetine, antipyrine, other valuable stuffs. Germany has also devel a system of textile schools as a result of which send our cotton to Chemnitz at six and seven a pound, to be manufactured there and sent bac us in the shape of knit goods at one dollar and ward a pound. All the freight charges going coming are paid to German ships, always to Ger labor, and all the dyestuffs come from the Ger manufacturers. We simply get our seven cents, pay back our dollar.

"Let us look into one of our homely products, and see what we might make of it, if our people had the knowledge and the skill. Reckoning our North Carolina cotton crop as worth to the producer an average of six cents from one year to another, we would have 500,000 bales, as cotton at six cents, yielding $15,000,000. This same cotton, manufactured into cotton cloth, would be tripled in value, and 500,000 bales, as cloth at eighteen cents, yields $45,000,000.

"We already manufacture about three hundred thousand bales into yarn, or into white and colored cloth, which means that we are turning about ten million dollars' worth of cotton into thirty million dollars' worth of product. We do this with our own home people as operatives; and, therefore, between the manufacturer, the operator, and the foreman, the whole two hundred per cent. is profit.

"With agricultural colleges, experiment stations, fertilizer control, and by other means, wisely prepared by our legislators, we have been able to keep down the cost of producing cotton to an extent to continue to control the production. The production and prices show, however, that we have reached a ten-million-bale crop, which at six cents has yielded us $300,000,000. We find that when we have a five-million-bale crop, it yielded us twelve cents, or the sum of $300,000,000, and when we made two and a half millions it yielded twenty-four cents, or again the same $300,000,000. Could we have curtailed the production and increased the price? Such a plan would seem to me impossible. India, copying our method and buying our machinery, is already producing more cotton than we did twenty years ago. Egypt, also, even at the low prices, is increasing her production. The English, who control both those countries,

are exerting themselves to the utmost to sti
cotton production in those countries.

"We have reduced the cost of production to
where further reduction can only be a diffe
quality; a saving of one cent a pound in pro
the entire crop of the State would only agg
two and a half million dollars, whereas the sam
manufactured into plain cloth, would be increa
value $30,000,000. In the distribution o
aggregate gain the farmer would be the g
beneficiary. Because of the proximity of the mi
North Carolina farmer already gets from one ha
to one cent more for his cotton than the Te
Missouri farmer gets. This is not all, howev
gets home markets for his fruits, vegetables, p
milk, butter, and a great variety of perishable
stuffs that can be produced on a farm, whi
operatives of the neighboring factory m
market. Whenever cotton is tripled in val
manufacture, the adjacent lands are tripled
value. The increased price of cotton, th
creased price of land, and the increased marke
all gain to the farmers, to say nothing of th
avenues of success and fortune opened up to hi
and daughters. Amongst our people the fa
interest in developing manufactures is the gre
In truth, in this generation, we can have only
manufactures as the farmers develop—for all
are, or have been, farmers.

"The estimate of an increase to three tim
value of raw cotton when made into cloth relate
to the plainest sheeting and plaids. This is
may be done with the least possible knowledg
skill. Take the fancy ginghams, such as the T
Nord, made by my friend, Mr. A. H. Lo

Fitchburg, Mass., and these will reach sixty cents a pound, or ten times the value of cotton at six cents. Our North Carolina crop of 500,000 bales worth as cotton $15,000,000, if made into the ginghams would be worth $150,000,000, or half as much as the entire crop of the South brings as cotton. Even this is not by any means the limit. My friend, Mr. H. H. Hargrove, of Shreveport, Lo., told lately of having weighed a dress pattern of fine French organdie. The entire piece weighed one third of a pound, and it sold at eighty cents a yard, or an aggregate of $24 a pound. The cotton in this was of course the best Sea Island, but even that probably cost not exceeding twenty-five cents a pound, while the product is selling in our stores here at $24 a pound. The difference is what we pay the German and French men and women, for their knowledge and skill—for their technical education, which we haven't got.

"The designs of the patterns are made largely by artists, affording profitable, agreeable, and artistic employment, at home, to young ladies, who are educated and skilful in artistic designing. It is evident from the prices charged for these goods that everybody who works in any of the processes gets high salaries, which makes the goods come high; but our home young ladies are beautiful, and must have beautiful goods to wear, even if the money must be sent to France and Germany, until our own people learn how to make the nicer fabrics. I have spoken of how a nice gingham costs sixty cents a pound. Omitting altogether the really finer stuffs, such as French organdies, and dotted Swiss muslins, and taking a fabric at $1.20 a pound, which could be made with a modicum of education and training, the North Carolina crop of $500,000 bales (I speak in round numbers always) would be worth, if factured into goods of this value, $300,000,00 much as the entire South's cotton crop is w raw cotton. I believe we have ample popula do this, and that all that is needed is knowle skill, or technical education."

CAPACITY OF THE PEOPLE

"Twenty years ago our friends in New E asserted with some emphasis that Southern could not manufacture cotton at all. It w that the climate was enervating, that the pe the South had no mechanical taste, and a other reasons were given why the attempt wo But it succeeded. Then it was said that some goods might be made but never the finer stu is not a matter of inherent capability nor of c but purely one of technical education.

"The development of our manufactures in t twenty-five years is a revival rather than development. The taste and capability ex by the present generation is an inheritance, a a thing of entirely new birth. In the early d the Republic the South was the manufa section of the Union. By the United States of 1810 the manufactured products of Virgin Carolinas, and Georgia exceeded in valu variety those of the entire New England Stat New York put together. The Henrietta Mill, near Rutherford, is on the site of an o works. The High Shoals Mill, now being bui Lincolnton, had to be cleared of some brick st old Catlin forges to make way for the new f tions. Throughout the Piedmont region the many evidences of former extensive manufacturing plants and much prosperity. I have at home a copy of a contract in accordance with which a machinist at Lincolnton made all the machinery necessary to equip a cotton mill complete having a date of 1813.

"This manufacturing spirit and its success gave rise to many schemes for internal improvement. Iron and other goods were carried from the Lincolnton and other Piedmont sections to Fayetteville by wagon, and thence down the Cape Fear River on boats, and thence to Boston in sailing vessels.

"The poison that ultimately destroyed this development, these great Southern manufacturing interests, was the institution of slavery. As this grew in strength, manufactures declined, until by the time of the war they were well-nigh dried up. There were those, however, who made a tremendous fight for their preservation and for the extension of our commerce. The founders of the Republic, most of the leaders amongst whom were Southern men, did everything in their power to develop American manufactures and retain American commerce; and these principles made better headway at that time in the South than in the North. Charleston had fair promise at one time of becoming the greatest American port. It was a promise based upon the capability and enterprise of her people. When the South Carolina Railway was built it was one of the great engineering works of the world. It was extended from Charleston to the head of navigation on the Savannah River, to take the cotton coming down the river in flat boats by rail to Charleston instead of letting it go in boats to Savannah. They extended a branch to Columbia, to catch the cotton on the

Congaree in the same way. Then they undertook to get a line through to the Mississippi River at Memphis, there to catch the cotton and Northwestern produce, and turn it to Charleston. Largely by the influence of the people of Charleston, the State of Georgia either aided or wholly built roads from Augusta to Atlanta and from Atlanta to Chattanooga—calling the latter the Western and Atlantic, the name indicating what the motive was in its building. There, pushing on farther, the Memphis & Charleston was built from Chattanooga to Memphis, the name again indicating some meaning as to the plans. When this road was finished, making a through route, there was a special run over the entire route carrying a party of Charleston and Memphis people, and also carrying a barrel of water which had been taken out of the Mississippi River, and which was emptied into the bay at Charleston, indicative, as it were, of the future course of the Mississippi River commerce. While not appreciating the increasing strength of slavery or its blighting influence, the people of the South, observing the tendency of manufactures to decline, made heroic efforts looking to internal development. After successfully developing a great railway line to Memphis, the people of Charleston formulated plans for building a direct road from Charleston to Cincinnati. Mr. Robert Y. Hayne was the chief promoter of the enterprise, and devoted much time to it. In getting the necessary legislation, his talents excited such admiration that he was sent to the United States Senate as the colleague of Mr. John C. Calhoun; and the debates betwixt Webster and Hayne about slavery were perhaps the most noted that ever were conducted in the United States Senate. But Mr.

Hayne, even at the height of his political fame, never lost sight of interest in his Charleston-Cincinnati railroad; and in the interval of his Congressional duties he spent much of his time in Asheville, N. C., looking after his interests.

"There was an extraordinary situation: Mr. Hayne was at the same time the teacher of two tremendous and opposing institutions, for the success of either meant the destruction of the other.

"Had the road to Cincinnati been completed, the tide of export commerce from Pittsburgh down the Ohio, thence from Cincinnati to Charleston, the agricultural products from Ohio, Indiana, and Illinois, then the Northwest but meagrely developed, and from the states south of the Ohio would probably have led to interests greater than that of slavery, and therefore to the peaceful abolition of the institution. Mr. Hayne succeeded, however, better with his defense of slavery than in the construction of his great railroad.

"In North Carolina Colonel John M. Morehead led the forces for internal development and the extension of commerce. He caused to be built the North Carolina Railroad, reaching from Goldsboro to Greensboro. Then also the road from Goldsboro to Morehead City. Then plans were formulated to build a road from Salisbury to the Tennessee line near Ducktown. It was then contemplated to form a private company to build a connection through to Chattanooga, thus reaching Memphis over the Memphis and Charleston. If this road had been built, and the roads all consolidated, North Carolina would now have a direct line from Memphis to tide water at Morehead City. Every phase of the history of your ancestors and their work shows them to have been men of sterling abilities and great enterprise. They ruled the government in those days because they had the best possible education and training in practical affairs.

"The increasing agitation about slavery and the increasing interest taken by Southern people in the subject gradually drew interest and energy away from the beneficent works of enterprise, and brought on the Civil War with its disastrous results.

SO-CALLED RECONSTRUCTION

"Comparing the wealth of this State with that of Massachusetts, it may seem to you that your parents had left you a scant inheritance. It may seem as if they had not made much of a success of life. Let us see to this. In the period that succeeded the Civil War the whole South was plunged into a state of semi-anarchy. After having all their property swept away, and the former system of labor completely destroyed, your parents had forced upon them an experiment in human affairs never before attempted in the world. It was one involving the ability of the white race to preserve the Anglo-Saxon civilization under the most adverse conditions and the most powerful opposing influences. Under far less pressure, the Latin race in Cuba and South America descended toward the inferior race. In a war for civilization lasting for a quarter of a century your fathers have held one hand ready at all times to defend their homes, while with the other the resources of the country have been taken care of. They have furnished the monopoly of the production of cotton. They have paid one third of an enormous pension list, getting nothing in return. They have paid two dollars for every one that could be applied to the education of their own sons.

"In the short period since the restoration of good government they have returned to the occupation of their ancestors, manufacture; and have demonstrated that cotton goods may be made here to advantage and profit, and on an export basis. They have developed a splendid industry in cotton oil, and on an export basis. In other parts of the South the passing generation has demonstrated the value of other resources, and the practicability of developing them profitably, such as iron, lumber, phosphates, etc. They have founded such schools as this, to prepare you to take charge of this great inheritance. All this is to be delivered to you unencumbered for you, as it has been for them in the past.

"They have won the fight for civilization. There is no race problem now. There is no anarchy. You have as fine opportunity before you as ever a generation of young men had in the world. If each of you, taking advantage of these opportunities, should grow rich, and should build honor for your parents and keep them in luxury the remainder of their days, you would not approximately settle the debt you owe them for what they have endured for civilization and for your welfare.

THE REAL RECONSTRUCTION

"The real reconstruction of this State is in your hands. It is for you to take up the great work of internal development where your grandparents left it off. I have attempted to show that you come of a race of broad-minded, progressive, and successful men. In their day and time they fostered by wise means the

"My idea has been to go ahead and open the school without asking for help beforehand, or support beforehand. I had thought of asking the following gentlemen to serve as a Board of Trustees:

R. H. Edmonds, Baltimore, Md.
J. O. Hemphill, Charleston, S. C.
James L. Orr, Piedmont, S. C.

"Also some good mill man in Augusta and myself. This would make five, which I think would be enough.

"Mr. E. W. Thompson, who has been with me about eight years, would make a good man to put in charge. He, with some bright young man to help him, could manage it to start with. Then with such help as could be gotten we could extend the school. Gifts of machinery or money could be solicited. We could also arrange with as many mills as possible to give work to the graduates. By this means we could guarantee an opening to the successful students. Of course a mill could do no more than put a graduate to work. His progress and advancement would depend upon himself. At present a young man of twenty years finds himself without an opening in manufacturing pursuits for want of knowledge or training of any sort pertaining to manufacturing. With the good will of mills to such a school the young graduate would find himself possessed of all these, viz.: the knowledge, the skill, and the opening in a mill to make a start.

"I have spoken privately to several of my friends about this plan. My suggestions have received the hearty approval of my friends as far as I have gone.

"I could put Mr. Thompson at Edgefield, say September 15th, and open up at once. I cannot undertake to do this without feeling that I shall have a strong support afterward from such men as you, Mr. Hemphill, and the mill men."

The impracticability of the Edgefield project was soon realized by Tompkins. He had formed it in zeal and enthusiasm; but his cooler judgment convinced him that textile schools are best established and supported, not by individuals, but by states or cities.

He now determined to promote the establishment of textile schools in the various Southern States to be under the control and support of the State governments. He turned his attention first to his native state. "I took up the subject with my friends in South Carolina," he says in his memoirs, "with the idea of having a textile department at Clemson College. I found it easy to excite interest. Mr. Benjamin R. Tillman, U. S. Senator, promptly favored my plans. Col. D. K. Norris, for whom I was engineering the new Norris cotton mill, also favored them. Finding public sentiment decidedly favorable and the prospects bright for the school, I decided to make a tour of inspection of the textile schools in the United States and England. I visited Philadelphia and looked over the textile school there. I visited England and looked up textile schools there. I was not only inspecting and studying these textile schools, but was on the lookout for a man to be director at Clemson if the textile department should be established. Mr. C. P. Brooks was recommended to me. After several conferences I asked him to bring his wife to tea with me at my hotel. He did so; and I was well enough impressed to make an engagement with him to go to America at a salary of $2,500 a year and expense of the trip over for him and wife. He was to be one of the engineers for the Tompkins Company; and, if the Clemson Textile Department was established, he was to go there if I wished it. Mr. Brooks worked for the Tompkins Company in this tentative way about a year. Meanwhile, the State of Massachusetts had inaugurated a movement for a series of textile schools, and the one at Lowell had been begun. Mr. Brooks' arrival in America and the purpose of his coming had been pretty well advertised by notices in the public press; and when Lowell wanted a textile director, they offered Brooks $3,500 a year. He consulted me as to his desire to take the place and his moral obligation to me. I promptly told him the offer was more than Clemson could pay, and advised him to accept it."*

Public sentiment in South Carolina was growing rapidly in favor of a textile department at Clemson, and the public looked to Tompkins to shape the policy of the department and arrange the courses of instruction. He was invited by the trustees of the college to present before them his views concerning the proposed textile department. After performing this duty, he subsequently, at the request of the Board, embodied his ideas in the following letter:

Charlotte, N. C., Aug. 24, 1897.

To the Hon. R. W. SIMPSON, Chairman
and the Board of Trustees,
Clemson College, S. C.

Gentlemen:

Pursuant to your request, made when I discussed before your board the subject of a textile department at Clemson College, I submit the following suggestions:

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*Mr. Brooks became first director of the Lowell Textile School and afterward director and organizer of the New Bedford Textile School.

I conceive Clemson College to have been established in deference to the wishes of the people of the state to have a school where the youth of the state could, in getting an ordinary college education, do it in a way that would qualify them to find an easier entrance into some profitable occupation than it was found could be done from the ordinary literary institutions. The education and training given at such an institution ought to be of a kind that is calculated to be most useful to the graduate and also of the greatest advantage to the other people of the state at large.

For the accomplishment of these advantages, it seems apparent that the courses of study and training should relate to those pursuits into which students could at once enter in the state.

Two industries which have developed more rapidly and more extensively perhaps than any other in the state, are the manufacture of cotton oil and the manufacture of cotton. The youth of the state have found employment to a very great extent in oil mills and cotton mills. What they know of these subjects has been necessarily picked up by the rule-of-thumb method. Both these industries furnish the most unlimited opportunities for the work of every graduate of Clemson inside the state. In cotton oil, besides the process of manufacture, there are great possibilities in refining, in making soap, in the production of food stuffs by mixing the hulls and meal, in making fertilizers, and in other ways. With a better knowledge of the subject many collateral industries might be established. Glycerine, candles, fancy soaps, table oils, and many other articles of great commercial value are already made from cotton oil in other sections of this country, and with a proper exposition of the knowledge relating to these subjects all these products might be made in South Carolina, furnishing lucrative employment to the young men of the state and keeping in the state a resource which comes from a product of the state.

In the manufacture of cotton the field is probably still greater; and the importance of extending amongst the youth of the state a knowledge of the textile art could hardly be properly estimated. Up to the present time the product of the factories of your state has been chiefly plain white cloth. Simple as the manufacture of this cloth is, it has been necessary to employ many men from other sections of the country to conduct these operations in South Carolina, while in many cases the young graduates of your state institutions, being untaught and unskilled in the textile art, have been compelled to go North or West to find employment in lines where their education and training in your schools is more applicable. It is noticeable also that those young men who want to go into some line of textile manufacture do not consider any Southern school, but go North either to a school or into the shops or in some engineer's office.

Some people think that the development of cotton manufacture in the South in the line of coarse white goods has nearly reached its profitable limit. If this is true, it is all-important that the youth of the present generation should be educated to extend it into other lines. The tendency will naturally be toward finer goods and toward colored dress goods, which is a field of infinite variety.

Your state was foremost in the development of cotton production. On plans that were formulated and executed first in South Carolina, the cotton area of the South is furnishing the great bulk of the cotton supply of the world. This was all original work. No other people had done such work. There were no methods to copy. Does it seem proper that in the manufacture of cotton the people of the state should content themselves with duplicating the simplest processes of cotton manufacture in other sections and be further content to carry on these processes largely under the direction of men brought from other sections, when a great many of the youth of your state are seeking profitable employment—in some cases, leaving the state to find it?

This subject of textile schools has received the most careful thought and attention in Europe. Some years ago it was noted in England that some of the continental countries, notably Germany and Switzerland, were making an increasing progress in capturing English trade. Even in England, educated young Germans were being employed as superintendents of dye works for their chemical knowledge and their practical training in making beautiful colors at cheap cost. Also for designing new and stylish patterns in various fabrics. It came to pass that not only English trade was suffering, but also the practical English dyer and the practical English weaver found German and Swiss young men taking their places. A commission was appointed to go to the continent and make a report of the cause of the growing continental trade. This commission found magnificent schools at Zurich, Chemnitz, and other places. Steps were at once taken to found similar schools in England. To-day, Manchester has a textile institution to furnish instruction day or evening, thus making it available to young men who have to work during the day and can only devote some time in the evenings to study. Many other English manufacturing centres have established similar schools. Some of the textile machine builders in England have founded schools of instruction in their works. It is astonishing to learn how much money has been spent on even those schools which are practically departments of the business of private firms. As to the value of all this expenditure, it is sufficient to say, nobody in England doubts the wisdom of the expenditure, but, on the contrary, the disposition is to still further increase and cheapen the facilities for technical and especially textile education.

In the United States the New England and the Philadelphia textile districts have both made splendid progress in providing for the collection and dissemination of knowledge in textile subjects. The first textile school of importance in the United States was established in Philadelphia some years ago. This school has been doing excellent work, and promises to be of great advantage to the Philadelphia district. At Lowell a textile school has lately been established by state and city aid. This school has been well equipped, and is doing well.

Such a department at Clemson College would undoubtedly contribute to diversify the manufacture of cotton goods in the state, and would probably at an early date bring about the establishment of one or more bleacheries and finishing works. Besides being of advantage to the youth of the state in qualifying them for profitable employment, it should be of great value in stimulating the development of the resources of the state in the line of textile manufactures.

Education, to be of value, must not be entirely pedagogic. If an educational system is applicable and successful in one section, an imitation of that system is not necessarily the best or even suitable for another section. What I say related, of course, to technical education in relation to its application to manufactures. Therefore, in the light of South Carolina's interests, I should put the study of cotton manufacture ahead of that of electrical engineering, for example. Both are important, and neither should be neglected; but if the study of one must be omitted, I should say teach textiles and let electricity go.

If I can serve you in any way whatever in connection with this matter, I beg of you to command me.

The trustees decided to establish the textile department, and invited Tompkins as constructing engineer to draw the plans for the building and supervise its construction. This pleasant duty he performed with skill, energy, and enthusiasm; and refused to accept compensation for his services. It had been a labor of love.

The dedication of the textile building and the inauguration of the textile department was celebrated with imposing ceremonies, of which the chief feature was an address by Tompkins.

His audience was composed largely of farmers. A few extracts from his address will show how easily he adapted himself to his audience and how strongly he could appeal to special interests and feelings:

"I regard it a rare privilege to be permitted to have a hand in the establishment of this textile school here to-day at Clemson College. The expenditure now being made of twenty-five to thirty thousand dollars is a far better start than any of the original German schools had. I have no sympathy with that helpless sentiment which would say Philadelphia has spent a half million dollars on her textile school, therefo our meagre twenty-five thousand dollars can accon plish nothing. I am one of those who believe th if only fifty dollars can be raised, a fifty-dollar sta ought to be made. If we want an oak tree and hav nothing but an acorn, let us plant the acorn an nurse the sprig and bush until we have th tree. . . .

"This school is supported in part by farmer Why should farmers pay for educating young men t operate cotton factories? Because by the establis ment of a factory in his neighborhood, with his sc as manager, the farmer can sell not only his cotton t the mill but also his apples, peaches, eggs, chicken cabbage, peas, and an infinite variety of stuff no unsaleable at any price, for cash to the operative And the money received for these is not local mone turned over, but it is in many cases brought fro abroad for cloth, and when let loose is in addition t the money wealth of a community.

"I hold that these new schools should be open n only to young men but to young women. Fro time immemorial the weavers of the world hav been women. Why, in an advanced state of the a should they be shut out? They can design fabric they can spin and weave as well as young men. favor their admission into this new textile depar ment.

"I believe we are going to make more cotton cheaper prices. Conventions to curtail productic will never have any influence. The best interest the farmer is to produce cotton cheaper, in larg quantity, thereby making it possible to send it farth and farther away from home. Inside of twent years the United States will make fifteen millic bales of cotton. We must make it cheap, spin it cheap, and weave it cheap. If we don't, other countries will do it. The more we spin and weave, the cheaper we can produce cotton. This is made possible by the foodstuffs consumed by the operatives. The farmer who can get money for apples that now rot can afford to raise and sell cotton cheaper. The time will come when a farmer living in a cotton manufacturing neighborhood can get more money in a year for butter, eggs, vegetables, and fruits, than his present cotton crop is worth.

"Are the people of this section fitted for factory management? I answer, Yes. In the early days of the republic the South led in manufactures. By the census of 1810 the manufactured products of Virginia, the Carolinas, and Georgia exceeded those of all New England. The manufacturing interests of the South were dried up by the institution of slavery. Since the abolition of slavery the aptitude of the Southern people for manufactures has again promptly shown itself. In the Spanish-American War the achievements of Hobson, Blue, Schley, and others have shown that with a reasonable chance the Southern youth stand always in the front rank. In the early days North and South Carolina had a well-developed iron industry. In the period since the war Alabama has set the pace for the manufacture of pig iron. The Piedmont region leads in cotton manufacture. The coming generation wants nothing but opportunity, and this opportunity is chiefly a matter of education of the right kind. Your agricultural college here is the foundation of that sort of education which makes the opportunity. The textile department which we are met here to-day to inaugurate will, in my judgment, make one of the most important departments in this school. Its work ought to and will largely increase the list of cash farm products. It will enhance the value of all lands that are near enough to a factory to reach the operatives with auxiliary products that are now valueless. It is notable that all factories in the South pay from $\frac{1}{8}$ to $\frac{1}{4}$ of a cent per pound more for cotton than the buyer for export.

"The farmers of South Carolina may well support a system of education that will bring wealth to the people of the State. Who would enjoy it more than their sons and daughters? Some of these will farm and some will run the factories. On the other hand, if our own sons and daughters are not trained for this work, then educated men and women must be brought here from other sections of our country, or from England and Germany, to direct the manufactures, while the sons and daughters of our home people will be compelled to work under the direction of strangers.

"I do not believe in the plan of waiting for foreign capital and foreign skill to come and develop our home industries. I believe rather in the value of teaching the sciences and the arts to our own boys and girls and of having our home industries developed at home by our home people. In saying this it is not meant to promote any sentiment for shutting out immigration, or to discourage the coming of foreign capital. People who depend on these, however, as against home effort, are not promoting the permanent interests of the South."

On the recommendation of Tompkins, Mr. J. H. M. Beatty was chosen by the Clemson trustees as director of the Textile Department. Mr. Beatty was qualified for the work by talents and experience. He had been associated with Tompkins for many years as machinist, mill builder, mill worker, and mill superintendent. The organization of the department was entrusted to Tompkins and Beatty, who made comprehensive plans for its equipment, direction, and growth.

The Clemson Textile School has surpassed the hopes of its most ardent friends. Its excellent work is a noble monument to the foresight, the public spirit, the engineering skill, and the organizing ability of Tompkins. It was one of the favorite children of his brain, for it represented in his mind the rebirth of his native state, the new foundation of a new South Carolina.

Tompkins now turned his attention to his adopted state, and united his energy, enthusiasm, and technical knowledge to other forces that were working for the establishment of a textile school in North Carolina. He neglected no opportunity for propaganda, and rallied all available forces, especially among the mill men of the Piedmont section. A fine sample of his skill, tactful management, and power as a promoter of public sentiment, is furnished by his utilizing for this campaign the closing exercises of the Atherton Mills Night School of Charlotte. He was president of the mills, founder and benefactor of the mill schools, friendly adviser in all the school work. The night school was a novelty in Charlotte and a favorite with the public. Its closing exercises were greeted by large audiences. The occasion was favorable for creating sentiment, and Tompkins used it. He selected as orator the Hon. Heriot Clarkson, leading member-elect to the Legislature from Charlotte; secured the attendance of prominent mill owners ands uperintendents; saw to it that influential mill workers from adjacent mills were on hand and treated with consideration; procured, as the honored and distinguished guest of the occasion, Director Beatty of the South Carolina Textile School. He focused on the closing exercises of this little night school the power, the enthusiasm, and the light of a hundred different forces. Everything went off with apparent ease and spontaneity; but those who knew Tompkins knew whose guiding hand was working unseen.

The *Textile Excelsior* gave the following account of the occasion: "Give honor where honor is due. Those men of our Southern country who are devoting much of their valuable time and talents to the cause of education and to the bettering of the conditions of our factory workers deserve present recognition for their services. The result of this means not the personal glorification of any of the leaders of such movements, but the awakening and coöperation of the communities. In this way the improvements are effected. D. A. Tompkins, of Charlotte, has been very active in this work of humanity. Through all the mediums of his sphere, and they are many and far-reaching, he has used his influence for good in this direction. His efforts, as chief promoter of the present South Carolina Textile School, as coadjutor with Dr. McAden and other mill presidents in bringing the hours for factory labor voluntarily down to eleven per day, all redound to his credit. As president of the Atherton Mills, Charlotte, Mr. Tompkins takes an individual interest in the factory hands. He has provided them not only a day school, but a night school as well. Closing exercises of the latter for the Christmas season were held in the Atherton Lyceum a week ago. On this occasion Heriot Clarkson, Esq., who has just been elected to the Legislature from this county, delivered a short address on 'Practical Education,' and in the course of his remarks said that it was his purpose to introduce in the coming Legislature a bill for a state textile school, and he intended to use his utmost endeavor to get the bill passed; that he thought it would be a most important movement and of great benefit to the mill owners and operatives in the State. Mr. Clarkson is one of the warmest friends of education for the masses, and of technical education for mechanics, artisans, and mill men, we have ever met. Several prominent mill men were present, also Prof. J. H. M. Beatty, director of the South Carolina Textile School, who said that he would be glad to see a textile school in North Carolina and would do anything he could to forward the movement. Mr. Tompkins awarded the prizes, which he had personally offered to inspire the students to greater progress."

On the meeting of the North Carolina Legislature Representative Clarkson promptly introduced his bill "for the establishment of the Vance Textile School." The bill was referred to the Committee on Education, of which a sub-committee was appointed to consider and report. Mr. Clarkson was chairman of the sub-committee, and at his request Mr. Tompkins furnished the committee with the following facts and figures:

"Gentlemen—Pursuant to suggestions made by you and other members of the House, I submit the following data:

Cotton raised in North Carolina, crop '96–'97, bales	521,695
Cotton manufactured in cotton mills, '98, bales	326,700

Spindles in South Carolina	1,325,390
Spindles in North Carolina	1,054,686
Spindles in Georgia	749,314
No. mills in North Carolina	220
No. mills in South Carolina	75
No. mills in Georgia	69
Looms in South Carolina	39,458
Looms in North Carolina	24,535
Looms in Georgia	21,094

PEOPLE EMPLOYED

Men	9,660
Women	13,240
Children over 14	6,190
Girls under 14	950
Boys under 14	810
Total wage earners	30,750
No. people supported directly	100,000
Aggregate wages	$5,670,490

Value of 500,000 bales cotton (about the State's crop) at 6 cts.	$15,000,000
Same, manufactured, at 18 cts.	45,000,000
Same, manufactured into finer goods, at 36 cts. (if we know how)	90,000,000
Enhanced value of raw crop at ¼ cts. advance	625,000
Perishable foodstuffs now annually paid for by operatives, formerly unsaleable (estimated)	2,000,000
Expenditures by State government to foster or promote this particular industry	0,000,000

Superintendent of North Carolina mills born and trained in other states (estimated)	100
Average salary (estimated)	$1,500

"Time to build a school and put it in operation, six months to one year.

"Some of these figures were kindly given me by the Bureau of Labor Statistics; most of them are estimates or taken from memory.

TEXTILE SCHOOL

Cost of building	$10,000
Cost of machinery, equipment . .	15,000
Cost of operating each year	5,000

Organization:	
One Professor	$1,500
One Assistant	1,000
One Assistant	600
Other Expenses	$2,600—6,000

"Regular Course Study—Two years for young men; special course for mill men. Could teach 50 pupils in regular course and 50 more in special instruction. Pupils from North Carolina now in Northern schools for textiles (estimated), 50. Tuition—Regular course, $60; special students, $5 a month; extra special as may be agreed.

"One school to start with in helping along to put value on cotton is very little to ask of the State. The mill men and operatives both want such a school. With astonishing frequency I have inquiries from bright and energetic young men about where they can go to learn the complete processes of spinning and weaving. With astonishing frequency mill owners are hunting men who know enough to superintend a mill, and not finding them at home have to send to New England or Old England.

"The mills, the operatives, and the youth of the State all need this school, and its provision by the Legislature would be a popular act."

The sub-committee recommended the bill; and in due time a meeting of the full committee was held for public hearings and discussion. The state papers of January 20, 1899, tell the story:

"The establishment of a textile school was the question discussed before the House Committee on Education yesterday. Not only was there a full meeting of the committee, but there were many visitors present to hear and take part in the discussion, among them the following prominent mill men:

"William Entwistle, John Gilligan, Dr. J. H. McAden, George E. Wilson, Dr. George A. Mebane, Julian S. Carr, R. S. Rhinehart, R. J. Brevard, C. T. Holt, E. L. Mooring, Donald McRae, W. H. Williamson.

"The bill immediately under consideration was that introduced last week by Mr. Clarkson, of Mecklenburg, for the establishment of the Vance Textile School. Though Mr. Clarkson was present and briefly explained the bill, the discussion that followed was upon the general subject of textile schools and the need for one in North Carolina rather than upon the particular provisions contained in the bill before the committee."

A large delegation from Charlotte was seeking to secure the school for that city as the centre of the cotton-milling industry in the two Carolinas. A delegation from Raleigh urged the establishment of the school as a department of the State College of Agriculture and Mechanic Arts, located in West Raleigh. Speeches were made by Mr. George E. Wilson, president of the Victor Cotton Mills, Mecklenburg County; by Maj. E. J. Hale, editor of the Fayetteville *Observer*, formerly United States Consul to Manchester, England, who "talked most interestingly of the textile schools in that great cotton-manufacturing centre"; by Mr. William Entwistle, superintendent of two of Rockingham's eight cotton-mills, "who came to this country from Lancashire, England, twenty-seven years ago as a mill worker"; by Prof. J. A. Holmes, State Geologist; by Mr. W. U. Hall, of the Bureau of Labor Statistics; by Mr. W. S. Primrose, chairman of the Board of Trustees of the State College of Agriculture and Mechanic Arts; by Mr. Richard H. Battle, and others. One of the most forcible speeches was made by Mr. W. J. Peele, chairman of a Committee of the Watauga Club,* who read a memorial of the club asking that the Textile School be established as a department of the State College of Agriculture and Mechanic Arts. "Wherever established," said he, "it ought to be in close touch with the mills and the mill men. They ought to be the directors of the institution, and all parts of the State ought to be represented."

The best of all the speeches was that of D. A. Tompkins, who was introduced as one of the mainsprings in the cotton mill movement in North

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*The Watauga Club was an organization of progressive and public-spirited young men seeking to promote the industrial and educational advancement of the State. This club, under the leadership of W. J. Peele and Walter H. Page, had been a potent factor in securing the establishment of the North Carolina College of Agriculture and Mechanic Arts.

Carolina, and known all over the South. Mr. Tompkins' talk was intensely practical. He declared that there was a great need of specialists—highly trained specialists—and that no money could be better spent than in training specialists to take charge of North Carolina's greatest manufacturing interest, the cotton mills. "Every dollar this Legislature, or others, may spend on textile schools will be returned a thousandfold. The question is not—'Can we afford to build the school?'—but, 'Can we afford not to build it?' If we do not train our young men and our young women, foreigners—by which is meant persons from other states—will get the positions and salaries and in many cases will eventually own the mills.

"North Carolina was a manufacturing state 75 years ago. In 1810 its people knew many times more about cotton and woolen manufacture than they know now, because then they made their own clothes. They made then many things better than they do now; but the growth of slavery drove out manufactures. Now we are coming to the front again, as we have $20,000,000 invested in cotton mills. These mills add greatly to our wealth; they raise the price of cotton to our home farmers at least one fourth of a cent, and they pay in wages an average of $5 a week to 30,000,000 workers employed in the mills. The mills consume about 320,000,000 bales of cotton yearly. This cotton—worth in the raw state 5 cents to 7 cents a pound—brings when manufactured 15 cents to 20 cents.

"If the school was started the bulk of machinery needed for teaching would be given by manufacturers. The textile school in South Carolina cost about $30,000, of which $15,000 was given by the

State. There is going to be a textile school in North Carolina. South Carolina and Georgia already have schools; Alabama and Mississippi are considering the matter. In less than ten years we will have $500,000 invested in a textile school. Our own children will make us do it."

Although the committee reported the bill favorably, a deficit in the state treasury, a financial panic, and a low price for cotton made its defeat inevitable before a timid Legislature.

But the prediction of Tompkins was fulfilled two years later when the next Legislature, yielding to strong popular demand, provided for a textile department of the State College of Agriculture and Mechanic Arts. Tompkins was a member of the Board of Trustees of the college; and, at their request, he drew the plans for the textile building and supervised its construction. He would not accept compensation for his indispensable services. His wise counsel and active coöperation in obtaining a competent director and faculty for the school, in securing donations of textile machinery, in arranging the courses of instruction, and in making known the advantages of the school to the North Carolina public, were beyond estimate in promoting its success. It started off with power and efficiency; and its subsequent career has been a fulfilment of its great mission. For this achievement Tompkins was chiefly responsible; he was its promoter, its builder, its organizer, and from its beginning until his death its chief friend and counsellor.

The next work of Tompkins and one of his finest achievements was the establishment of the Mississippi Textile School. This he accomplished by a single speech. Public sentiment in Mississippi was favorable to a textile school. The speeches and writings of Tompkins and other industrial leaders had prepared the ground; and the existence of similar schools in North and South Carolina and Georgia had aroused in Mississippi a feeling of generous rivalry.

But public sentiment was not unanimous, and the establishment of the school by no means assured. The Legislature met; and a bill was promptly introduced to establish a textile school as a department of the State Agricultural and Mechanical College.

At this critical moment Tompkins arrived in Jackson, in response to private telegrams, and was greeted by an invitation from the Legislature to address them on the advantages of textile schools. The two houses met in joint session; and after hearing a powerful, convincing, and inspiring speech from Tompkins, passed the bill without discussion. Of this speech the New Orleans *Picayune* said: "The speech delivered by Mr. Tompkins came in the nick of time, removing all doubt among certain members as to the wisdom of such an appropriation. This is the greatest work that this Legislature has done. It serves notice on the world that Mississippi is going to be in a position not only to foster cotton mills but that the sons and daughters of the State are to reap the salaries that in the absence of textile education must inevitably go to the sons and daughters of other states who would come to Mississippi equipped to earn such salaries and to officer the mills—building, and to be built."

The trustees of the college engaged Tompkins to design the plant, organize the equipment of machinery, and formulate the courses of study and training for the new textile school. This duty he performed with his accustomed skill, efficiency, and unselfish patriotism, refusing compensation for his services.

By invitation of the Legislature of Texas Tompkins discussed before a joint session of that body the subject of textile schools; and, subsequently, following the example of North Carolina, South Carolina, and Mississippi, the State of Texas established a textile school as a department of its Agricultural and Mechanical College.

A similar discussion was made by Tompkins before the Legislature of Louisiana, at the close of which the following resolution was adopted:

"Resolved by the Senate and House of Representatives in joint session assembled, That the earnest thanks of these bodies be tendered the Hon. D. A. Tompkins, of North Carolina, for his able, instructive, and patriotic address and effort to lift the South from the slough of industrial depression, and to light it back to that high plane of prosperity in which it stood in ante-bellum days."

Tompkins' speech before the Mississippi Legislature was as follows:

"THE IMPORTANCE OF TEXTILE EDUCATION AND TEXTILE SCHOOLS IN THE SOUTH

"Since the foundation of the republic three generations have lived and passed away. In the first third of the century, dating from the War of Independence, the South led in education, in manufactures, in commerce, and in wealth. In the second third of the century the South still led in education and in wealth, but the institution of slavery had stifled our manufactures and seriously impeded the progress of our commerce and brought on the

Civil War, which ended with the abolition of the institution.

"In the last third of a century the South has been carrying on another war, a war of more than thirty years for white supremacy. The Civil War, from '60 to '65, demonstrated the tremendous force of character and courage of the people of the South. The thirty years' war for white supremacy and Anglo-Saxon civilization demonstrated that the sons of those who had been charged with being impetuous fire-eaters could be infinitely patient, judicial minded, and firm as a rock in standing for a principle involving Christian civilization.

"When slavery existed, the manufactures established by our grandfathers were dried up. When slavery was abolished, it was impossible to reëstablish manufactures pending the restoration of law and order.

"Promptly on the restoration of governments capable of guaranteeing security manufactures began at once to grow.

"Our grandfathers were a great people. So also were our fathers. But the greatest generation of Southern people is the one that since the Civil War has at all times trained one hand to arms for the defence of Southern homes, while the other has been kept trained to those occupations that would make a living for those living in the homes. Speaking in round numbers, I give the following record:

"In the first decade after the Civil War we made 2,500,000 bales of cotton at twenty-four cents, $300,000,000. In the second decade we made 5,000,000 bales of cotton at twelve cents, $300,000,000. In the third decade we made 10,000,000 bales of cotton at six cents, $300,000,000.

"This is a wonderful record and a discouraging record. Four times the cotton and exactly the same money.

"Meantime, India and Egypt are now making more cotton than we made twenty years ago. The treading upon our heels by those countries, with larger quantities of cotton at lowering prices, makes it clear that there can be no remedy in curtailment of production to increase price. Any curtailment of our production means that the people of other countries will make more cotton. If we would continue to control the production, we must make large quantities at cheap prices.

"This monopoly has been so far preserved by wise legislation of the various Southern States. It has been done by establishment of agricultural colleges, departments of agriculture, boards of fertilizer control, and other liberal and advantageous measures.

"With the highest opinion of the value and the necessity for all these measures, I want to show you that there is another end to this problem on which we can work to advantage. We can continue the control of the production of cotton by its manufacture.

"The fortunes of the cotton farmer and planter can best be revived by the manufacture of cotton. It is a great thing to have developed the production of cotton to the extent of 10,000,000 bales. This alone is sufficient to mark the people of the South to be of great capabilities and resources. Other countries have the land, the climate, and the people, but none have developed the business to any commercial proportions, except on lines you have laid out. But you have reduced the production to such perfection that while still further improvement is possible, an improvement of one cent a pound in reduction of cost of production would mean only $50,000,000 saving on the entire crop.

"If, however, we manufacture the whole crop into the simplest, plain white cloth we change its value from $300,000,000 to $1,000,000,000. Here is a profit to the South of $700,000,000, or more than two hundred per cent. Of course, this is not profit to the stockholder, but if our home people do the work, and Southern fuel and other supplies are used, the whole increased sum must be profit to the South. Much of it goes to labor now unemployed or unprofitably employed.

"To make a simpler proposition, let us take 10,000 bales as the production of an average county. These at six cents (average price the last few years) would yield $300,000. Now let this cotton be manufactured into plain, white sheetings, which sell at five cents a yard, and the product is worth $1,000,000. Assume that this is done with home people (and in North Carolina it is), is done with home fuel (and it can be), and practically the whole increased sum becomes profit to the county. In other words, a county which sells its 10,000 bales of raw cotton gets for it, from England or Germany, $300,000, while, manufactured at home, the county gets the following:

Farmers, for foodstuffs	$250,000
Merchants and bankers, for groceries, clothing, discounts, interest, etc. .	150,000
Stockholders' profits	100,000
Farmers, for wood and miscellaneous services and supplies	50,000

Lawyers, doctors, preachers, and teachers	$50,000
Savings of operatives out of wages, etc.	25,000
Improved roads, public buildings, and other public improvements	25,000
Wasted by operatives	25,000
Miscellaneous	25,000

"It will be seen that out of this extra return the farmer gets an extra $300,000, or just as much money as he got for his raw cotton. He would get this for his perishable products, which now practically have no markets. These would be meat, meal, flour, chickens, eggs, butter, milk, potatoes, onions, cabbage, turnips, peaches, apples—in truth, for everything that grows on a farm.

"By means of the factory and the demands it makes upon the farm the land is vastly increased in value. It transpires that wherever cotton is tripled in value by manufacture, then the adjacent farms are also tripled in value.

"It is by this means we can continue to control the production of cotton. Double the farmer's income on a fixed production of cotton and he can continue to produce the cotton for the world and undersell the Egyptian.

"The development of the South requires manufactures. The interests of the cotton farmer require, above all things, that his cotton be manufactured at home to give him home markets for all his other farm products.

"The development of manufactures requires, first of all, education and transportation. England and Germany send ships here for our cotton at an average price of six cents a pound. Those countries manufacture it, and re-sell the products to South best educated people of the Union. Also because they had great interests developed, and great interests require and develop great statesmen as great wars require and develop great generals.

"To develop here a great industry and great interests cotton is your best basis. You must have schools to teach the science and art of cotton manufacture.

"The best contentment in life comes from having learned to do some profitable thing better than anybody else can do it. To accomplish this, study and practice are necessary. It is as easy to learn all about a loom as it is to learn all about football. It requires as much practice to become a superior weaver as it does to become a superior football player.

"The management of a spinning frame and the making of yarn is not near so difficult as the management of a sewing machine and the making of clothes. In every household it is well understood that a careful study of the principles of a sewing machine and a lot of practice are necessary to the making of a satisfactory operator on a machine. It is better for a girl to go to some normal school or female college, but it is not necessary. Some of the very best housewives never go to college at all. They acquire superior capabilities by careful observation and continued practice. As it is in the household so it is in a factory. The average girl knows that if she would keep a good house, she must study and practice. Perhaps her mother is her only teacher, and she may have no opportunity to practice except at home.

"The boy who expects to manufacture cotton should learn the principles involved in each machine in the mill and acquire the necessary skill to operate it, just as his sister learns the sewing machine an cooking utensils at home, and acquires skill in th handling of them.

“In modern education far too little stress is laid o practice, where the future occupation is to be i dustrial. Manufacturing, housekeeping, music, an painting are all sciences and arts. The schools ma teach the sciences involved, and to a limited exten the arts. Take music, for instance. It may b taught at school, and to a limited extent practised a school, but to be a successful musician means lon and arduous practice after the schooldays. I music the teachers all emphasize the futility of ex pecting success in music without this arduou practice subsequent to the schooldays. But man of the technical schools let the idea grow amongst th students that the college course alone will fit them t manufacture cloth or make yarns. For the be work the school is essential in manufactures as i music. But also for the best work practice is a essential in manufactures as in music. The be music draws the biggest crowd to the concer Every musician will say that, as a rule, the be music means the most practice. The best cloth wi have the preference in every store. The best clot means the most skill, which in turn again means th most arduous practice. So it is in housekeeping, s in painting, and in other callings. Genius is mostl application.

“Of two boys, one having a fine technical educa tion with a little practice, the other having only common school education, and having served a fu apprenticeship, the chances for success are four to on in favor of the latter. Put the technical educatio and the apprenticeship together, and the youn man having both is at once a master of his occupation.

"The latter is the way it was with the planter's son before the war. From the day of his birth till he went to college he was serving an apprenticeship on a plantation. He didn't realize it, but he did serve the apprenticeship. He rode the mules, drove the horses, helped feed the hogs, was in close touch with the negroes. At twenty-one years of age, with or without a college education, he could run a plantation, and do it well. Nine times out of ten he was successful in life.

"The youth of to-day needs the same sort of education to fit him for modern conditions. The youth of to-day ought to understand a loom as well as his grandfather did a mule. He ought to know every phase of cotton manufacture as well as his grandfather knew every phase of its production. Practice in the different operations is the way to get the skill.

"In thus exhibiting the importance of practical training with this technical textile education I am urging upon you, I do so to show that the higher education in this line will open up the way for practical and profitable occupation for every boy and girl now unoccupied, even though they do not have opportunity to go to the technical school. Let the higher school open up the way with its higher teaching and training, and this opens up the way for profitable occupation and opportunity for every farmer's son or daughter in the State, and for all other people who need an opportunity to get a start in life. I am a machinist by trade, and made my start in life as a machinist. The chance that spinning and weaving offers for a start in life, though lowly in the beginning, has before it unlimited opportunity for wealth and honor. Some of the most distinguished men of the world have often started some narrative by saying, 'When I was a weaver!'"

It may truly be said of Tompkins that he was the chief promoter and builder of Southern textile schools, as he had been of cotton mills and cotton oil mills. With him schools and mills were both essential parts of a great industrial system.

"We have reached the limit," said he, "of what may be done with picked-up knowledge and ignorant labor. The remedy is schools for textile instruction. They will multiply mills, enhance the value of mill products, and create home markets for perishable farm produce. Cotton mills and textile schools together make the remedy for the depressed condition of farming in the South."

CHAPTER XIII

AUTHOR OF BOOKS ON COTTON INDUSTRIES

THE culmination of Tompkins' career as a missionary of cotton was his authorship of books on cotton industries. These books were the products of his experience, and dealt with actual mill problems in the Southern States. They are intended for books of instruction in textile schools and for the guidance of mill owners, mill builders, and mill workers. Although sufficiently technical, they are interesting to the general reader, as they furnish a picture of the Old South growing into the new.

His first book was entitled, "Cotton Mill Processes and Calculations, an elementary textbook for the use of textile schools and for home study, with appendix containing tables, rules, and recipes. 300 pages, 50 original drawings."

In the preface the author states the plan and purpose of the book, and sums up for cotton mill apprentices the philosophy of success:

"It has been attempted in this volume to give a description of the machines, and exhibit their various functions; also to give rules and formulas for making the calculations, in such a simple way that they may be followed out by any person of ordinary intelligence, and with only a limited common school education.

"To the student and apprentice, for whom this book is intended, it might not be amiss to say that skill in operating machines and in keeping a manufacturing process well balanced throughout cannot be acquired by reading any book. Both knowledge and skill are necessary in the production of good music. So, in the manufacture of cotton, knowledge and skill are equally necessary to get the best results. The best success will not come to the young man who acquires the fullest knowledge and omits the practice necessary to make him skilful. Neither will it come to the one who works longest and hardest, and never studies. But rather to the one who with discretion and energy devotes reasonable time to the acquisition of both knowledge and skill."

The first edition was quickly exhausted, being widely used in mills and textile schools, as well as in demand by general readers and students of the industrial South. Its commendation by the press was equally gratifying. "One of the best books ever published in the South," said the Raleigh *News and Observer*, "is 'Cotton Mill Processes and Calculations,' by Mr. D. A. Tompkins, the practical and wise manufacturer of Charlotte. This book may be said to mark a mile-post in the industrial history of North Carolina. The State has passed out of the experiment of manufacturing raw cotton into yarn; it will henceforth teach the youths of this and other states. Yesterday it sat in the schoolroom, near the foot of the class, doubtful if it could be a great manufacturing state; to-day it is a teacher, with pupils thronging its industrial academies desiring to learn the problem of converting raw cotton profitably into finished products. In the industrial progress of the State Mr. Tompkins has been a helpful and inspiring factor. His book will be invaluable, and the fact that there is a demand for it shows that we go forward."

"Cotton Mill Processes and Calculations," said the Norfolk *Landmark*, "is in every respect a notable work. It is the first book written and published in the South on the important subject of cotton manufacturing. Mr. Tompkins is intensely practical. What he has to say is not based upon mere theoretical knowledge but also upon actual and extensive experience. No man is better qualified to utilize experience, and profit by its lessons, than is Mr. Tompkins. To the youthful student and the apprentice, especially, Mr. Tompkins addresses himself, desiring to impress upon the young workman of intelligence and ambition the great truth that success comes not to mere skill of the hand and eye, nor to mere theoretical knowledge, but to a judicious combination of manual skill and technical knowledge. The whole wisdom of active life is here condensed by Mr. Tompkins into the compass of a few words."

His next book was entitled: "Cotton Mill Commercial Features, a textbook for the use of textile schools and investors, with tables showing cost of machinery and equipments for mills making cotton yarns and plain cotton cloths."

"This is the author's second volume of a series on cotton mill subjects," said the *Manufacturers' Record*. "The first volume treated of the interior detail of cotton mill machinery and its management. The present volume is devoted to the commercial and financial aspects of the business. It is a book which the business man can read with pleasure. It is not encumbered with technicalities which usually load down books treating of special industries. It is a straightforward and easy discussion of the business principles underlying the organization of a new company for cotton manufacture, the building of the plant, keeping the accounts, and disposing of the product. The author is a Southern man intensely interested (financially and sentimentally) in Southern institutions, but he takes pains to show in every case that the true road to advancement in cotton manufacturing lies in the harmonious coöperation with Northern and Eastern mills for the acquisition of the world's markets."

"A valuable feature of this book," said the New Orleans *Picayune*, "is its presentation of the theory that more wealth accrues from the sale of the manufactured article than of the raw material. The author directs attention to the great increase of cotton manufacturing in the cotton states. He adduces many striking facts to show how the new enterprises have worked for the general prosperity of the South. In a suggestive chapter on textile education Mr. Tompkins deals with the movement on behalf of technical training which has lately sprung up in the Southern States. He explains at some length exactly what ought to be taught in textile schools. Another chapter is devoted to the new conditions of labor which have sprung up as a result of the evolution of the negro. Mr. Tompkins even goes so far in this subject as to present plans for cheap but comfortable houses for the accommodation of the laboring class. This work is unique as well as comprehensive. Mr. Tompkins has rendered a great service to the South in compiling it. The book is copiously illustrated, the plans of machinery and mill construction being a particularly valuable feature."

His next book was entitled: "Cotton Values in Textile Fabrics, A Collection of Cloth Samples, Arranged to Show the Value of Cotton, when Converted Into Various Kinds of Cloth."

The purpose and character of this book are set forth in the preface, which says:

"This collection of samples of cotton goods with data on costs per yard and per pound was prepared to show the possibilities that lie in our cotton crop. Opposite each sample is shown the value of a good North Carolina crop, 500,000 bales, reckoned as raw material, and sold at a normal average price of six cents per pound or thirty dollars per bale. Contrasted with this valuation is shown what the same half million bales would bring if manufactured into goods like the samples, at normal average prices.

"The cheapest sample shown is duck, worth fourteen cents per pound. Half a million bales of cotton in this shape would bring thirty-five million dollars, or nearly two and a half times its value in the raw state. The whole crop of the country, say eleven million bales, if manufactured into this goods and sold at this price, would show a gain over the raw price of more than four hundred million dollars, or more than five dollars per capita for all the people of the Continental United States.

"To manufacture the entire cotton crop into duck would be a misfortune, somewhat akin to selling the entire crop in its raw state. But cotton may be made into numerous other forms to produce even greater values, as is shown by the succeeding samples, the last of which shows that if the North Carolina crop could be converted into Swiss embroidery and sold at twenty dollars per pound, it would bring five billion dollars. This is about equal to all the money received for all the raw cotton grown in the United States in the past twenty years. It is more than enough to buy all the cotton and woolen mills in the world!

"To manufacture the entire crop of the country into embroidery would be as undesirable as to turn it all into duck. These extreme figures are given to show the wide range of possibilities in the business. They exhibit the relative gain in both cases and not the absolute result to be attained.

"All of the samples shown are made of cotton; but some of the finest were not made of the ordinary cotton of our commerce, and therefore it may be contended that the claim for such princely values in our cotton is beyond the mark. But the goods were made of a kind of cotton. This cotton was grown under certain conditions. If these conditions were well understood, and the production of cotton carried on with sufficient skill, these fine grades of cotton could be raised over large areas now devoted to the ordinary kind.

"Therefore the argument resolves itself into a question of proper education and thrift to turn a possible cotton crop into thousands of times the money now realized on it by the people who produce it. In other words, in undertaking to exhibit the values to which cotton may be brought the subject covers improvement of the lint by the grower as well as improvement in spinning and weaving by the manufacturer.

"Part of the difference between the price of raw cotton and the retail prices affixed to the samples shown is created by the merchant and not all by the manufacturer. But nevertheless there is a gain to the community by reason of the goods having been manufactured at home. The very process of manufacturing is conducive to greater volume of mercantile business from the fact that many people ar thus given employment who would otherwise be idle These people become wealth producers, and becom much larger consumers of all commodities tha before.

"The grower of unimproved raw cotton no receives but a modicum of its possible value. It i hoped that this collection of samples, though givin but a minute suggestion of the infinite possibilitie may point the way to greater returns for the labo of the people in the cotton-growing states, and lea them to find out the steps necessary to acquire th skill for producing better qualities of cotton, and fo turning this better cotton into goods of greate value."

This little book went like a missionary through th South. Five editions were called for in five years.

It shows at a glance the value, on the one hand, finished products and skilled labor; on the othe hand, of raw material and untrained muscle.

VALUE OF 500,000 BALES OF COTTON PRODUCED IN NORTH CAROLINA*

Not Manufactured: sold in bales @ 6 cts.	$ 15,000,00
Manufactured: into Duck @ 14 cts. per lb.	35,000,00
Manufactured: into Drilling @ 16 cts.	40,000,00
Manufactured: into Sheeting @ 18 cts.	45,000,00

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*The prices given in this table were the market prices at the time of the publication the little book.

Manufactured:—into Bleaching @ 20 cts.	$ 50,000,000
Manufactured:—into Tick @ 24 cts.	60,000,000
Manufactured:—into Cheviot @ 26 cts.	65,000,000
Manufactured:—into Denim @ 30 cts.	75,000,000
Manufactured:—into Plain Gingham @ 34 cts.	85,000,000
Manufactured:—into Shade Cloth @ 34 cts.	85,000,000
Manufactured:—into Madras @ 40 cts.	100,000,000
Manufactured:—into Long Cloth @ 70 cts.	175,000,000
Manufactured:—into Mercerized Cloth @ $1	250,000,000
Manufactured:—into Gingham Lawn @ $1.70	425,000,000
Manufactured:—into Poplin @ $1.80	450,000,000
Manufactured:—into Fancy Gingham @ $2.20	550,000,000
Manufactured:—into Persian Lawn @ $4	1,000,000,000
Manufactured:—into Embroidery @ $20	5,000,000,000

The last and in many respects the most interesting of his books on cotton industries was the following: "Cotton and Cotton Oil:—Cotton Planting, Cultivating, Harvesting, and Preparation for market —Cottonseed Oil Mills Organization, Construction, and Operation—Cattle Feeding, Production of Beef and Dairy Products, Cottonseed Meal and Hulls as Stock Feed—Fertilizer Manufacture, Manipulation, and Uses. Full Information for Investor, Student, and Practical Mechanic."

Aside from its technical contents, "Cotton and Cotton Oil" is full of interest. It describes Southern industrial conditions before, during, and after the Civil War, the old Southern plantation, the growing and marketing of cotton, the growth and influence of cotton mills, the utilization of cottonseed, and the beginning of a new agriculture. It contains a very interesting chapter intended to show that the cotton saw gin was invented by Hodgin Holmes, of Georgia, and appropriated afterward by Eli Whitney, whose invention was a roller set with teeth or spikes, but lacking saws.

The four books forming this series have been highly praised:

"The Editor of *Cotton and Finance*," says Theo. H. Price, "desires to make our acknowledgments to Mr. D. A. Tompkins for some pictures of the cotton boll in its various stages of development recently published by *Cotton and Finance*. They were taken from 'Cotton and Cotton Oil,' one of a series of books of which he is the author. These books, taken together, form the most valuable and compact reference library with regard to the history of cotton cultivation and manufacturing of which the writer has any knowledge."

"This series of books," says the *Manufacturers' Record*, "is devoted to various aspects of the cotton trade—growing the crop, manufacturing it into different classes of goods, selling these and finding new markets abroad for increased sale and consumption. Each book is an attempt to supply a much-